the OIL AND GAS JOURNAL

Rates: Domestic, 1 year, $6.00; 6 months, $3.00. Canadian and foreign, 1 year, $7.00; 6 months, $3.50. All subscriptions are payable in advance.

Extra copies of special issues are reserved for subscribers' needs and may be purchased by subscribers at the price of 50 cents per copy.

MAY 27, 1937 VOL. 36, NO. 2

Table of Contents

News Developments

Summary 7
John D. Rockefeller's Ideals Shaped Oil Industry Policy 8
Trends Influencing the Natural Gasoline Industry—*By W. T. Ziegenhain* 12
New Processes and Products Occupy N.G.A. Meeting—*By C. O. Willson* 14
Careful Development Marks Goldsmith-Cummins Field—*By Neil Williams* 17
Natural Gas News 20
Natural Gasoline News 20
Pipe Line Activity 21
Refinery Projects 21
East Texas Crude Price Increased. Texas Allowable Cut. Bureau of Mines Recommendations 23
Editorial 24
Survey of East Texas Field at Kilgore A.P.I. Meeting—*By Mitchell Tucker* 25
Universal Oil Products Co. Insert ..... Opposite 64

Engineering—Operating

Unusual Operating Conditions Found in Capitan Field of California—*By T. P. Sanders* 28
Polymerization and What It May Mean to the Natural Gasoline Industry—*By G. G. Brown and D. L. Katz* 30
Operating Ideas 34
Johnson Oil Installs Two-Coil Selective Cracking Unit at Cleveland —*By William J. Leenhouts* 37
Present and Future of Pumping Wells in the East Texas Field—*By G. L. Nye and E. B. Miller, Jr.* 41
General Conditions in the East Texas Field—*By W. S. Morris* 49
Factors Causing Corrosion in Cracking Units—*By F. L. Newcomb* 55
French University Producing Specialized Technicians—*By Dr. P. M. Edmond Schmitz* 59
Use of Filter-Aids in Improving Quality of Refined Products—*By F. L. Horine* 62
Complex and Unsaturated Naphthene Hydrocarbons—*By W. L. Nelson* 161
Problems From Readers—*By L. G. E. Bignell* 166
Technical Questions—*By C. K. Francis, Ph. D.* 168

Field Operations

Field Operations Summarized 173
California—*By L. P. Stockman* 174
Central West—*By George A. Whitney* 176
Gulf Coast—*By F. L. Singleton* 177-195
Eastern Fields—*By Staff Correspondent* 178
Kansas—*By Dal Dalrymple* 179
Oklahoma—*By Dal Dalrymple* 182
North Louisiana-Arkansas—*By Mitchell Tucker* 186
Southwest Texas—*By George Weber* 188
Rocky Mountain Area—*By Tolbert R. Ingram* 189
West and North Texas—*By L. E. Bredberg* 193
Kentucky 194
East Texas—*By L. E. Bredberg* 197
Canada—*By Victor Lauriston* 199
Michigan—*By Paul A. Elliott* 200
Wildcat Operations ..... 201 to 209

Markets and Prices

Group 3 Market—*By T. F. Smiley* 214
A.P.I. Refinery Report 215
New York Market—*By H. Stanley Norman* 215
Tank-wagon Markets 216
Refinery Prices 217
Crude Prices 218

Additional Features

Oil Man's Calendar 210
Record of Oil Securities 211
Do You Remember 212
Personal Paragraphs 212-213
New and Improved Equipment 219-221
Classified Advertising 222-223
Advertisers' Index 224

P. C. LAUINGER, President
C. O. WILLSON, Editor
W. T. ANDERSON, Managing Editor
JAMES McINTYRE, Consulting Editor
W. T. ZIEGENHAIN, Engineering Editor
L. G. E. BIGNELL, Prod. Engr. Editor
C. K. FRANCIS, Ph. D, Technical Editor

W. L. NELSON, Metallurgical Editor
T. F. SMILEY, Associate Editor
DAL DALRYMPLE, Associate Editor
D. H. STORMONT, Associate Editor
T. P. SANDERS, Associate Editor
S. H. ROURKE, Business Manager
M. F. BALDWIN, Circulation Manager

NEIL WILLIAMS, 1114 Sterling Bldg., Houston
GEORGE WEBER, 1114 Sterling Bldg., Houston
F. L. SINGLETON, 1114 Sterling Bldg., Houston
L. E. BREDBERG, 617 Petroleum Bldg., Fort Worth
TOLBERT R. INGRAM, 130 State Office Bldg., Denver
L. P. STOCKMAN, 313 Union Oil Bldg., Los Angeles
PAUL A. ELLIOTT, Chronicle Bldg., Muskegon

MITCHELL TUCKER, 717 City Bank Bldg., Shreveport
H. STANLEY NORMAN, 415 Lexington Ave., New York City
HENRY D. RALPH, 1224 Natl. Press Bldg., Washington
J. P. O'DONNELL, Derrick Bldg., Oil City
GEORGE A. WHITNEY, P. O. Box 98, Toledo
PAUL REED, 114 W. 2nd St., Tulsa
VICTOR LAURISTON, Box 136, Chatham, Ont., Canada

ADVERTISING: E. KLAPPENBACH, Manager.

C. L. CAIN, 415 Lexington Ave., New York City
HOWARD MARKT, 802 Leader Bldg., Cleveland
C. R. FARMER, 616 S. Michigan Ave., Chicago
K. J. LANGLEY, 114 W. 2nd St., Tulsa
WAYNE RIVES, 1114 Sterling Bldg., Houston
J. H. TINKHAM, 1406 S. Grand Ave., Los Angeles
A. J. CHAMBERS, Cologne, Germany

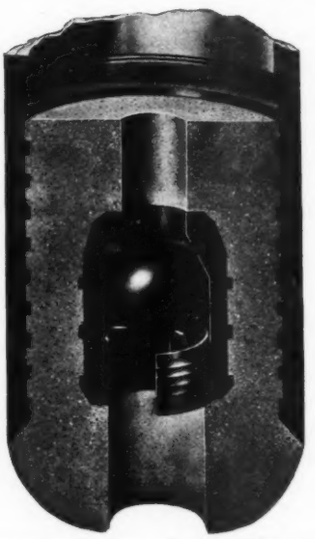
Copyright, 1937, by The Petroleum Publishing Co.

See for Yourself

WHY AND HOW THE UNQUESTIONED SUPERIORITY OF DESIGN AND OPERATION OF THE BALL-TYPE VALVE USED EXCLUSIVELY IN BAKER CEMENT EQUIPMENT AFFORDS THE *ULTIMATE IN VALVE EFFICIENCY* . . .

HERE IS THE VALVE ASSEMBLY COMPLETE

Sectional view of Baker Cement Float Shoe showing the complete Bakelite Valve Assembly firmly anchored in Baker-Formula Concrete. Note how the Assembly is set on end to present a minimum cross section to the drilling bit.



ONLY BAKELITE IS USED IN CONSTRUCTION OF VALVE ASSEMBLY

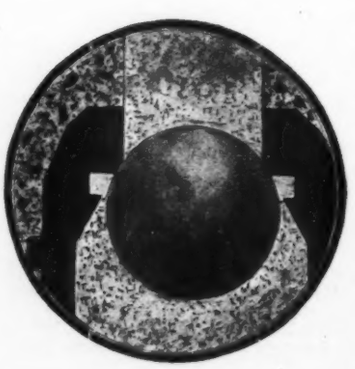
The Valve Seat, Cage and Ball of the Baker Valve Assembly are constructed entirely of Bakelite—a resin-like substance produced when carbolic acid is treated with formaldehyde and combined with powdered cellulose flour derived from wood or similar substance. This material is moulded under heat and pressure and then cured to the required hardness and friability. This friability provides the feature of being easily drilled up into small particles. Laboratory tests on the Bakelite Valve Seat, Cage and Ball have shown a strength far in excess of any pressure that might be encountered in the hole.

AMPLE CIRCULATION AREAS

As clearly shown in the accompanying illustration, Baker Bakelite Valve Assemblies are made with ample circulation areas to insure adequate and unrestricted passage of the cement. These areas, however, have been carefully designed to give the very desirable "wash-down" action that is so essential in many fields.

IMMEDIATE AND POSITIVE VALVE CLOSURE

The double-sealing action of the Baker Valve Assembly eliminates all possibility of leaking while floating in a string of casing and provides an immediate and positive valve closure following the cementing operation. Note how the ball fits tightly on its upper seat (a rubber ring backed by Bakelite) while the casing is being floated in. During cementing operations, it rests on projecting fingers around which the cement passes in an unrestricted flow through the passageways in the Bakelite Valve Seat.



BAKER BAKELITE VALVES OPERATE IMMEDIATELY AND POSITIVELY. THEY FURNISH A LEAK-PROOF SEAL AGAINST EITHER LOW OR HIGH PRESSURE WHEN FLOATING-IN AND STOP ANY CEMENT FROM BACKING UP INTO CASING WHEN PUMP PRESSURE IS RELIEVED.

. . . and in addition to valve efficiency, Baker gives you *STRENGTH and DRILLABILITY*

STRENGTH

It is stronger than the collapsing strength of the casing upon which it is run—safe for strings of any length.

DRILLABILITY

The plug and valve assembly being made of Bakelite and Baker-Formula Concrete permits both materials to be quickly and easily drilled out, drilled up and circulated out of the hole with the rotary mud. No dangerous metal is left to prevent coring directly below the shoe, or to deflect the bit and start an off-vertical hole.

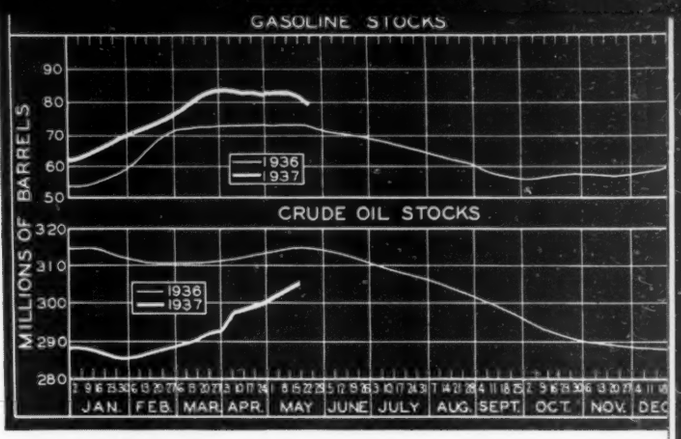
It is BAKER Valve Efficiency combined with STRENGTH and DRILLABILITY that provide the perfectly balanced equipment for guiding, floating and cementing strings of casing.

Look on Pages 189 to 206 of the BAKER CATALOG or the 1937 COMPOSITE CATALOG for more complete details.

BAKER OIL TOOLS, INC.

Telephone JEfferson 8211 – HUNTINGTON PARK, CALIFORNIA – 2959 E. Slauson Ave.
Telephone WAyside 2108 – HOUSTON PLANT AND OFFICE – 6023 Navigation Blvd.
MID-CONTINENT OFFICE AND WAREHOUSE:
Telephone 2-8883 – Tulsa, Oklahoma – 312 East Fourth Street
WEST TEXAS BRANCH OFFICE Odessa, Texas – Telephone 217
EXPORT SALES OFFICE Rm. 1914 – 19 Rector St., New York City Tel. Digby 4-8515
ROCKY MOUNTAIN HEADQUARTERS Tel. 2230-Casper, Wyoming – Box 1464

BAKER CEMENT EQUIPMENT



Price Raise Changes Oil Picture

ANOTHER peak in crude oil production was lost sight of with the announcement Saturday of an 8-cent advance in East Texas crude oil. The increase was posted by all other buyers the first of this week. The question uppermost in the minds of operators was whether or not higher price levels for this largest single crude supply of the industry would be confined to the one area.

CRUDE PRODUCTION *3,553,235 barrels daily average—up 3,414 barrels.*

CRUDE STOCKS *305,365,000 barrels as of May 15—up 1,217,000 barrels.*

GASOLINE STOCKS *79,827,000 barrels as of May 22—down 551,000 barrels.*

REFINERY RUNS *3,290,000 barrels daily average past week—up 155,000 barrels.*

The company originating the advance and several others who met it explained that the higher schedules were due to a local condition in which premium-paying had become an important factor in the movement of crude. Payments of premiums, usually concealed by various types of price arrangements, have been reported in East Texas for several months. It is claimed that the practice has become more pronounced and open since the first of the month with large companies losing important lease connections to buyers who entered into long-time contracts with producers, the agreements providing for a stipulated premium over the posted schedules.

Several factors are offered in explanation of the position of East Texas crude, which is strong despite a condition approaching weakness in other sections where crude has been going to storage for months. No increase in allowable production; dependence on the field of several coastal refineries for the bulk of their crude supply; pipe line capacity in excess of requirements; quality of crude and a large export demand all have contributed to the present strength of the East Texas market. The open-market situation has been revealed for some time in the tanker quotations at the Gulf for export and coastwise movement. These quotations represented premiums of 5 to 8 cents per barrel above the posted field prices, with full allowance for pipe line and loading charges.

It is felt that developments in other areas will be dependent on the success of the plan to end the weekly additions to crude storage in June through reductions in current output. The Bureau of Mines recommended production for June is 3,366,000 barrels daily, 187,235 barrels less than the daily output of last week. Texas and Oklahoma state authorities plan to keep within the recommendation, a program which if carried out, will mean substantial reductions in their output. Other states are expected to do likewise.

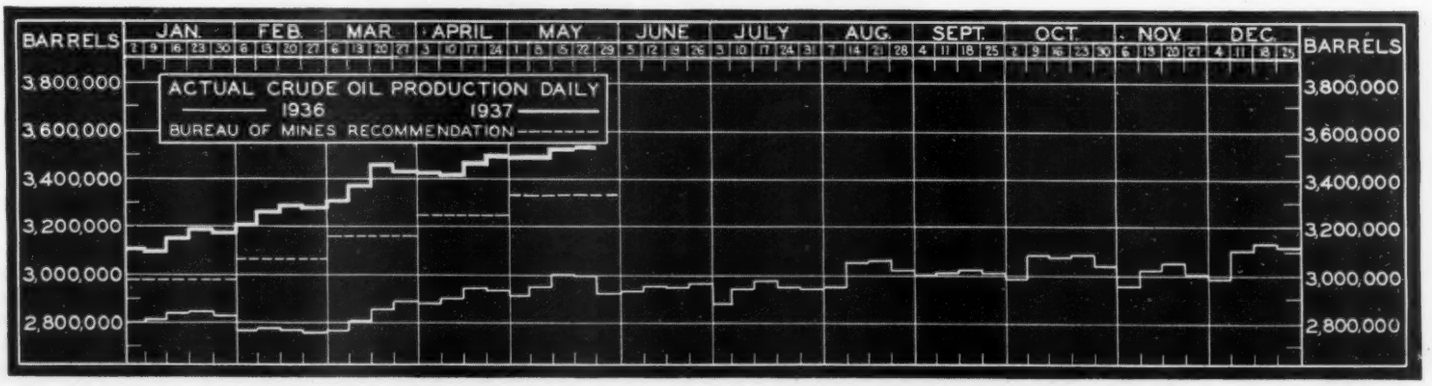
The first big well completed in the Illinois Coal Basin area will be the center of considerable wildcat drilling. The world's deepest oil well was producing 37 barrels per hour in Coastal Louisiana.

Daily Average Production for Week

	May 22, 1937	Bur. Mines May est.	May state allowables	May 15, 1937
Oklahoma City	169,525	.....	.....	169,700
Fitts	89,225	.....	.....	96,525
Remainder of State	390,975	.....	.....	394,424
Total Oklahoma	649,725	622,700	622,700	660,650
East Texas	464,957	.....	.....	463,547
West Texas	208,546	.....	.....	208,800
Texas Panhandle	84,948	.....	.....	84,297
East Central Texas	122,849	.....	.....	121,448
North Central Texas	106,699	.....	.....	105,800
Gulf Coast Texas	335,248	.....	.....	332,296
Southwest Texas	105,150	.....	.....	105,151
Total Texas	1,428,397	1,340,800	1,448,700	1,421,339
North Louisiana	76,130	.....	.....	75,725
Gulf Coast—Louisiana	166,300	.....	.....	167,400
Total Louisiana	242,430	249,400	240,900	243,125
California	659,000	583,300	*603,900	656,000
Kansas	197,550	187,100	187,100	198,475
Arkansas	27,120	28,500	.....	27,425
Eastern Fields	116,700	117,400	.....	114,000
Michigan	44,243	34,900	.....	44,397
New Mexico	113,540	99,800	114,000	114,020
Rocky Mountain area	74,530	69,000	.....	70,390
Total United States	3,553,235	3,332,900	.....	3,549,821

Increase 3,414 bbls. daily.

*Recommendation of Central Committee of California Oil Producers.



John D. Rockefeller's Shaped Oil Industry

The death of John D. Rockefeller, Sr., at his Florida home Sunday morning, two years and one month short of the century he hoped to live, removed the most famous oil man the world has known.

Strange to say, although his name has been familiar for more than 60 years wherever oil was used, he was not originally an oil producer. What he saw of the risks and chaotic competition in the production of oil in those days was too much like a gamble for his orderly business mind. He must have then and there decided that while there was money to be made in refining and selling oil it would be wiser to leave the finding and production of it to more adventurous spirits.

Another point he noted was that while other refiners were buying oil from jobbers it would be more advantageous to buy it at the well. Primarily he was a business man, not a producer or a refiner, although in time he became an authority upon every phase of the industry.

He was the persistent foe of circumlocution, of lost or waste motion, of blind alleys or sidetracks that diverted production and distribution from the straightest channel. He was ever seeking a shorter, more direct, more economical and better way. Not for the immediate making of more money but for the longer-range purpose of producing a better product at a smaller price thereby increasing sales and ultimate earnings.

As the business grew Mr. Rockefeller, ever vigilant for increased efficiency, allowed no detail to escape. The acquisition of pipe lines, the manufacture of tankcars, and even of wooden oil barrels, all contributed to his ideal of a thoroughly organized unit.

Once launched in the business, he charted a course of his own, distinct from the frenzied gamble for production and the reckless scramble for markets. He foresaw wider opportunities and prepared to take advantage of them. He planned more efficient organization to reduce costs and produce a superior product. He saw that, by reason of wealth and population, Europe was the greatest market of the time, and through his efforts Standard kerosene became one of America's first large scale industrial exports to the Old World. The familiar account of the designing of a cheap and simple lamp to promote the consumption of kerosene in the Far East belongs to this period.

But this success was not won without battles at home. As the business expanded with the addition of integral units competitors were attracted or absorbed by its success. Business methods in those days were comparatively unregulated either by law or public opinion and no quarter was given. Outdistanced rivals believed the worst.

The Standard Oil Co. of Ohio, organized in 1870 as a refining and marketing company, was the first great integrated organization in the oil business. The Ohio Oil Co., a producing company, was acquired in the latter eighties, the first large scale producing enterprise of the Rockefeller interests.

In 1882 the various units, in consonance with Mr. Rockefeller's ideal of organization, were compacted into the Standard Oil Trust, a title that became the battlecry of antitrust legislation from that day to this. Subsequently dissolved, it was reorganized as the Standard Oil Co. of New Jersey, which included 33 component companies until the dissolution in 1911.

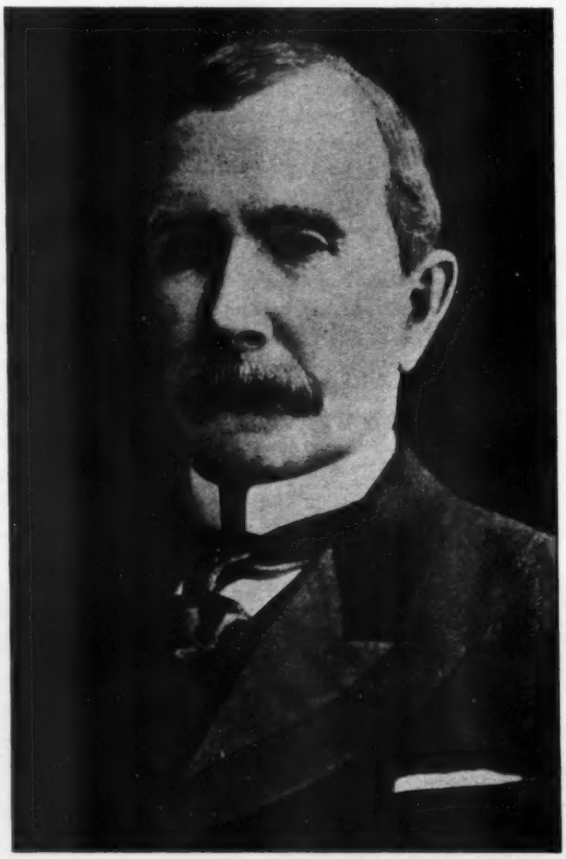
The effect of the dissolution decree was altogether different from what had been expected outside the Standard organization. This was due to the principles which Mr. Rockefeller had followed in building up his great system. His policy had been to attract the ablest men in the business and to give them full opportunity to develop their ability.

As E. T. Bedford once described it, it was "organization without compulsion, the highest type of loyalty with the largest degree of individual initiative."

The dissolution decree separated the units but could not affect the esprit de corps. Each unit carried on its individual initiative so successfully that some of the companies formerly included in Standard organization have since grown, to general outside amazement, greater than the parent company before the dissolution. Surely a tribute to the founder.

Mr. Rockefeller retired from active business life in 1896 when he was 57 years of age. That was before the great discoveries in the Mid-Continent and Texas had carried the industry into the Southwest. There is no record of his ever having visited any of these fields. His only reported tour of an oil field was in Titusville in 1860. The greatest of oil men, he was peculiarly aloof from personal contact with its operations. He watched it grow through the eyes of the marvelous organization he had built.

John D. Rockefeller found the oil business a gamble. He left it one of the most efficient business organizations the world has seen. He taught it not only by example but by force of superior competition based on sheer efficiency. He was the supreme organizer whose methods have made American efficiency the model for the world.



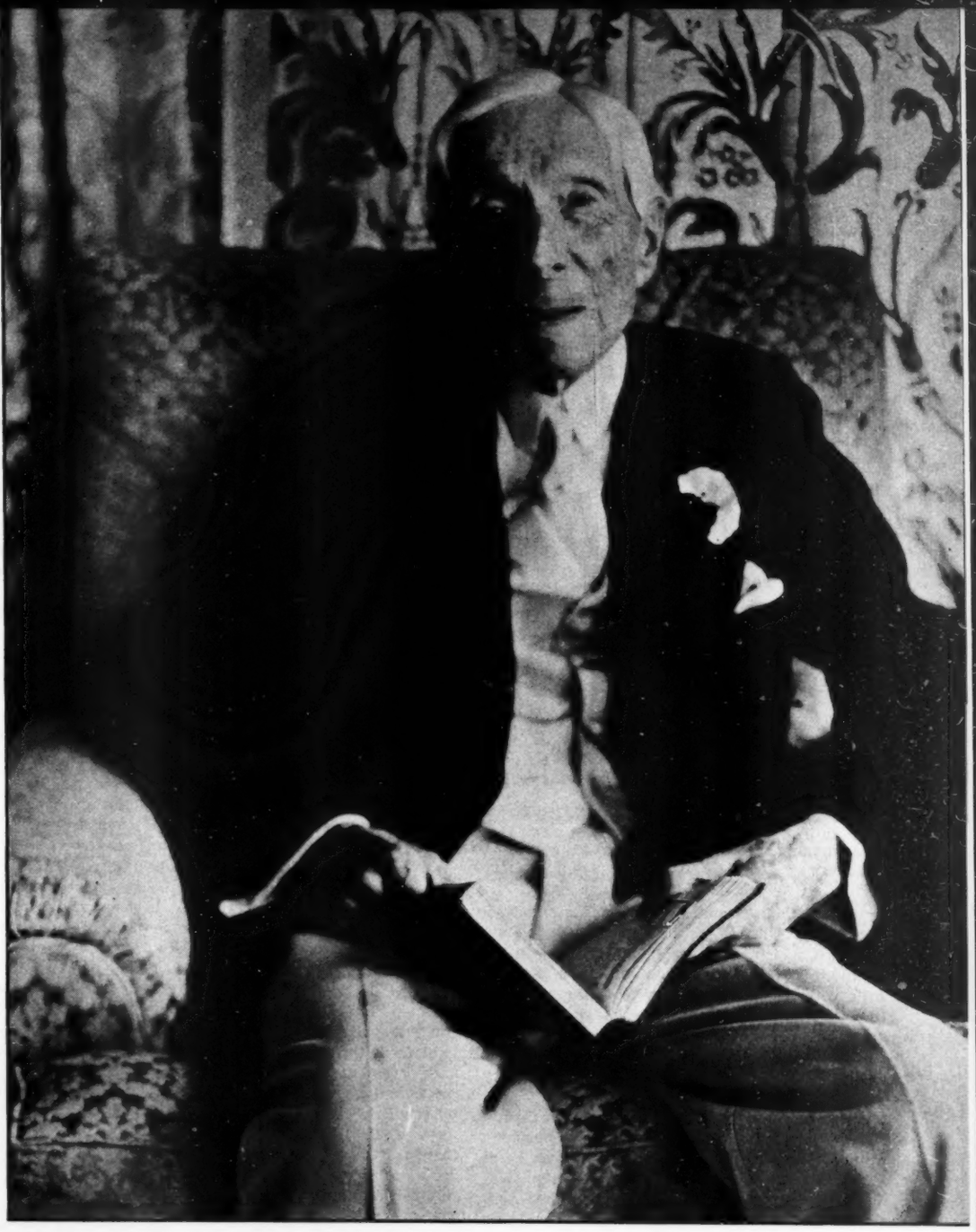
"Persevere. If you make a mistake, remember it is human to err. Try again and try harder." Mr. Rockefeller at the crest of his active career, in 1888

John Davison Rockefeller was born at Richford, Tioga County, New York, July 8, 1839. He was the fifth generation in descent from Johann Peter Rockefeller, who with his sons came to America from near Coblenz on the Rhine in 1720 and settled in New Jersey. The family was originally French, named Rochefeuille or Rocquefeuille, meaning Rockleaf, and had lived in Languedoc, fleeing when the Huguenots were being persecuted, in 1685.

Mr. Rockefeller's father, William Avery Rockefeller, was a shrewd farmer and doctor, who often went away from home on long trading trips. His mother was Eliza Davison, daughter of John and Cynthia Davison of Niles Township, near Moravia, N. Y. She was noted for her deep interest in religion and her firm though gentle rule of her children. The family lived five years near Moravia and removed to Owego, N. Y., where John D. and his brother William attended for two years the old Owego Academy.

"I had a peculiar training in my home," Mr. Rockefeller once said. "I cannot remember when hard work was new or strange to me. We were taught to work, to save and to give. Ours seemed to be a business training from the beginning. We were encouraged to be self-reliant. I was taught to do as much business at the age of 10 and 11 as it was possible for me to do. I was sent over the hills to buy

Ideals Policy



"There is no feeling in this world, I think, to be compared with self-reliance, without which we can do nothing." Mr. Rockefeller on his 97th birthday

cordwood. I did not require the presence of anybody to enable me to secure good measure of wood from the men who sold it. It was good training for me."

John D. Rockefeller's first business transaction was when he was 8 years old, on the farm near Moravia, it has often been recalled. A turkey hen had wandered away and hidden her nest, and the boy's mother told him he could have the brood of little turkeys if he could rescue them. He found the nest, raised the turkeys and sold them. After several frugal years he accumulated $50, which he loaned at 7 per cent. At the age of 14 he dug potatoes for a neighbor for three days of 10 hours each, and received $1.12. This made him think: The pay for three days of back-breaking toil was less than one-third of a year's interest on his $50. He resolved to make more savings work for him.

The family removed to Cleveland, Ohio, in 1853. The boy spent a year and a half in high school, only to find he could not afford to go to college. Instead, he paid for a three months' course in a commercial school, and managed to learn in six weeks all they could teach about bookkeeping and business theory. In August, 1855, he began to look for work. From eight in the morning until six in the evening for a week he tramped the streets of Cleveland, asking bankers, railroad officials and wholesale business men for a job. The only answer he got was, no; but he began the same round the next Monday morning and kept at it for six weeks, when Hewitt & Tuttle hired him to be assistant bookkeeper in their produce commission warehouse on the lake front. That was September 26, the day he got his first job, which he ever after celebrated.

In his fifteenth year he joined the Erie Street Baptist Church in Cleveland, now the Euclid Avenue Baptist Church. It was a poor, struggling mission church, with a mortgage for $2,000. When the pastor announced one Sunday that the house was to be sold to pay the debt, young Rockefeller stood at the door and begged a contribution from every one who went in or out. Some could give only 10 cents a week, few as much as $1; but he begged for months until he raised the $2,000 and saved the church. Later he became superintendent of the Sunday school, a position he held for more than 30 years.

"The religion of a man is his most important possession," he said. "There is nothing in the world that can compare with Christian fellowship; nothing than can satisfy but Christ."

The boy did not know what his pay for his first job would be until the end of the year, when they handed him $50 for more than three months' work. The next year he drew $25 a month, and the next year $50. From the beginning he kept an exact record of every cent he received and paid out. He worked hard, audited scrupulously every bill of the firm that was to be paid or collected and succeeded in collecting some old balances that had been regarded as hopeless. He became known to the business community as a steady, self-contained, frugal youth, free from bad habits, reliable, and a steady attendant at church and Sunday school.

When he was 18 years old his employer raised his pay to $700 a year. He asked for $800, but could not get it. He had saved nearly $1,000; so after a careful look around he invested his savings plus $1,000 borrowed from his father in a partnership with Maurice B. Clark, an Englishman 10 years his senior, and they opened a commission business.

"We were prosperous from the beginning," Mr. Rockefeller declared in one of his talks to the Bible class. "We did a business of $450,000 in the first year. Our profit was not large—I think $4,400." Although he was a junior partner, he thoroughly organized the business, practiced the most rigid economy, drove close bargains, and lived as frugally as ever, putting most of his profits back in the business, "to grow."

Young Rockefeller daringly assumed large financial obligations to carry the firm through business deals that seemed safe to him. He borrowed all his father could lend, needed more, and summoning up courage asked a banker for a loan of $2,000. The banker lent him the $2,000 on his own warehouse receipts. The lad of 19 walked out elated. He felt he was a man full grown. Indeed, his fellow merchants called him "Mister Rockefeller" long before he was 21.

A bank president warned him one day that he had borrowed nearly all the money in the bank.

"Our board of directors want to see you and talk with you," he said.

"I'll come right down," Mr. Rockefeller replied. "I'll come right away; for I want to borrow a great deal more."

When Drake "struck oil," in 1859, there was a rush to the new field from all parts of the land. But the young merchant stayed out, questioning and studying for more than two years. Then he and his partner joined with Samuel Andrews, who had learned the art of cleansing and refining petroleum, organized a separate firm to refine oil, under title of Andrews, Clark & Co. They built a small refinery on the bank of Kingsbury Run, near Cleveland.

This business, by mutual consent, was put up

"Be earnest; do not be afraid to work." Mr. Rockefeller, (about 60)

at auction in 1865, and Mr. Rockefeller bought it in at $72,500. Thus began the firm of Rockefeller & Andrews, which grew within five years into the Standard Oil Co. of Ohio, incorporated in January, 1870, with a capital of $1,000,000, a vast sum in those days. In the meantime Mr. Rockefeller's brother William, Henry M. Flagler, Stephen V. Harkness and others had joined the enterprise Less than 10 years had passed since Mr. Rockefeller entered the oil business.

John D. Rockefeller and his associates though young were experienced veterans in business, trained for years in ways of economy and exact accounting. They seemed to manage better than their competitors, and when they formed the Standard Oil Co. of Ohio they had the largest refining business in Cleveland.

Nevertheless they told their neighbors that, unless some sort of organization could be formed for mutual protection, they could see that they as well as the others would be wiped out one by one as the market fluctuated. Accordingly, Mr. Rockefeller first asked the largest firm among his competitors if it would care to join forces with the Standard Oil Co. It accepted at once. One by one other neighbors came in, until at the end of two years nearly all of the petroleum refiners of Cleveland were members of the Standard Oil Co.

"We were simply trying to compass a situation," was the answer Mr. Rockefeller often gave when asked why he organized his company. "No man, no concern, was ever forced into the Standard Oil Co. The charge is false. We treated the smallest and weakest among our competitors with just as much consideration as the biggest and ablest. Our organization was formed upon the principles of cooperation, conservation and service."

In later years the charge was often repeated that the Standard Oil Co. coerced rivals to join it under penalty of being "crushed" out of business. On this point John D. Rockefeller wrote in his "Random Reminiscences" as follows:

"The conditions were so chaotic and uncertain that most of the refiners were very desirous to get out of the business. We invariably offered those who wanted to sell the option of taking cash or stock in the company. We very much preferred to have them take the stock, because a dollar in those days looked as large as a cartwheel, but as a matter of business policy we found it desirable to offer them the option, and in most cases they were even precipitate in their choice of the cash. They knew what a dollar would buy, but they were very skeptical in regard to the probabilities of resurrecting the oil business and giving any permanent value to these shares."

Cleveland became one of the principal oil refining centers of the country. The Standard Oil Co. provided its own pipe lines for gathering the crude oil, its own tankcars for carrying it in trainload lots, thereby effecting a great saving, and its own depots and warehouses and docks at shipping points for the foreign trade. Other refiners bought barrels from coopers; the Standard made barrels by machine in its own shops, bought whole forests of timber, built drying houses and dried the wood before shipping, thus saving the cost of carrying sap; made its own glue and paint; in a word, saved money on every process that goes into the gathering, preparation and selling of petroleum products. The company's corps of scientists toiled incessantly in the laboratories, constantly discovering new ways of using the by-products of petroleum, which hitherto had been wasted.

The South Improvement Co., an ambitious combination of railroads and oil refiners projected by Col. Thomas A. Scott, head of the Pennsylvania Railroad, declared they would "wipe Cleveland off the map" in the oil business because they had a much shorter haul from the oil fields to the seaboard; but Cleveland, with the advantage of cheaper freight by the Erie Canal, was able to meet that competition. The Standard Oil people, as a measure of safety, they testified later, subscribed to stock in the South Improvement Co., but so many oil producers and refiners denounced the project as a monopoly that its charter was revoked before it did one cent's worth of business or had even distributed its stock to the subscribers.

Then the principal refiners of Pittsburgh and Philadelphia sought to join the Standard Oil organization. They were welcomed into the alliance of interests, as were many other concerns in New York, New Jersey, New England and the oil regions of Pennsylvania and West Virginia. For several years the stocks of these several companies were held in a private trust; but in 1882 the Standard Oil Trust was formed to hold them all. Pipe line companies and other companies for gathering, distributing and marketing petroleum products in all parts of the world were organized, and all worked in cooperation for the general benefit.

Mr. Rockefeller seemed to have a genius for selecting men of high character and great business ability to join his organization. They were able to achieve greater success in his companies than they could have made by themselves. During the quarter of a century which he devoted to developing the Standard Oil Co. to a degree of power of service and of profit beyond precedent he always spent three or four afternoons a week building roads or planting trees on his broad estates, or driving his speedy trotters, or riding a bicycle, never failing to take his regular sleep of an hour or so after luncheon every day. He saved his own energy as frugually as he saved everything else. Commenting on the many days he spent at play in the open country, Mr. Rockefeller used to refer to himself as "a sort of fifth wheel in the business"; but he had a marvelous capacity for remembering details of all the activities, and whenever his judgment was sought on any subject he seemed as well informed as if he had spent all his time on that one thing.

At the height of his active career, Mr. Rockefeller directed the affairs of 33 oil companies and influenced indirectly the business policies of hundreds of corporations, including many forms of modern industry, except those that made or sold strong drink. Their combined capitalization ran into billions, and they employed hundreds of thousands of men and women. He was the business partner of many American millionaires, and he owned blocks of stock in most of the trunk line railroads. For several years his companies controlled four-fifths of the oil business in the United States. The total dividends paid by the Standard Oil combination from its formation, in 1882 to its dissolution, in 1911, were estimated at $751,000,000.

His fame passed through various social phases, his money was sought and accepted to found institutions for the study and suppression of disease, and to spread education and religion. His gifts were criticized by some who called him a "public menace" because of what they thought were his business methods. One gift he made was attacked by critics who called it "tainted money," alleging that his business system destroyed open competition; but after an investigation the gift was accepted.

"What we need most is the spirit of fair play among men." At the polling place when 68 years of age.

No man or corporation in the public eye has ever been more bitterly assailed than John D. Rockefeller and the Standard Oil Co.

"Sometimes things are said about us that are cruel and they hurt," said Mr. Rockefeller at the time Miss Ida Tarbell and other magazine writers

were attacking him and his business methods. "But I am never a pessimist; I never despair. I believe in man and the brotherhood of man, and am confident everything will come out for the good of all in the end. I have decided to say nothing, hoping that after my death the truth will gradually come to the surface and that posterity will do strict justice."

Mr. Rockefeller retired from active business about 1896 although he retained the title of president of the Standard Oil Co. of New Jersey—the form into which the Standard Oil Trust had been reorganized until November, 1911. This was after the decree of dissolution made by the U. S. Supreme Court against the company. The constituent companies were even more successful after the dissolution. Although no longer in personal touch with Standard Oil and other commercial affairs, Mr. Rockefeller to the last supervised his many investments, which he entrusted to various representatives.

He devoted the latter years of his life to devising and developing methods for giving away his wealth. He applied himself as zealously to the task of giving as he had to the task of getting. The spirit in which he worked is expressed in the charter of the Rockefeller Foundation, "to promote the welfare of mankind in all parts of the world." To this object he applied the same vision and economy that he had employed in business. During a whole generation he worked hard and faithfully at distributing. Above all he sought, as he often said, "to solve the problem of giving money away without making paupers of those who receive it."

To this end he gathered around him a body of advisers and established a group of benevolent corporations, chief of which are the Rockefeller Foundation, and the General Educational Board, the Rockefeller Institute for Medical Research and the Laura Spelman Rockefeller Memorial.

"I investigated and worked myself almost to a nervous breakdown in groping my way, without sufficient guide or chart through the ever-widening field of philanthropic endeavor," said Mr. Rockefeller in explaining his methods. "It was forced upon me to organize and plan this department upon as distinct lines of progress as our other business affairs.

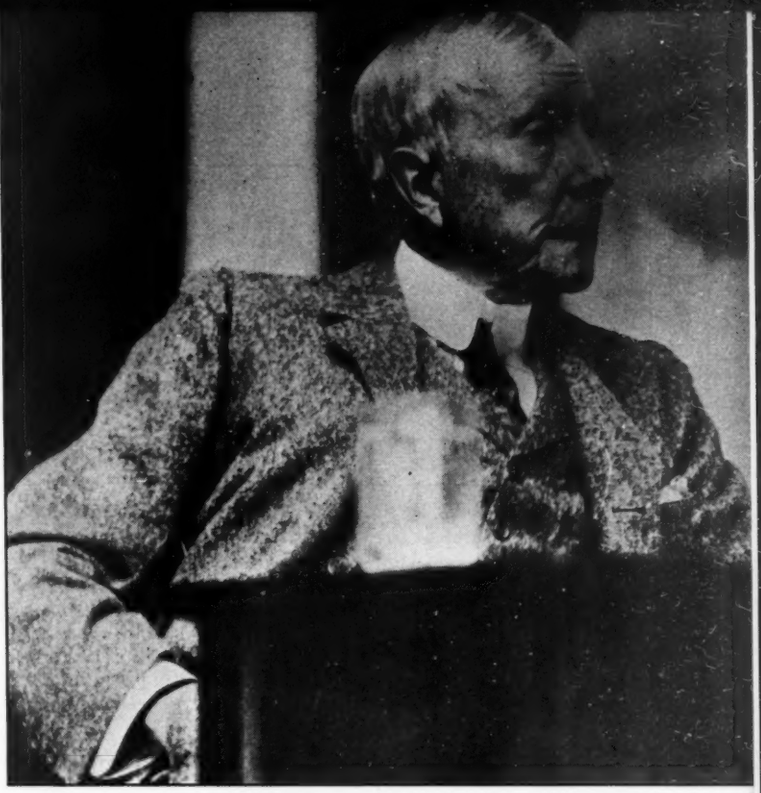
"I have always indulged the hope that during my life I should be able to help establish efficiency in giving, so that wealth may be of greater use to the present and future generations. If the people can be educated to help themselves, we strike at the root of many of the evils of the world."

Always he felt his way slowly and with extreme caution. Before giving the first $100,000 to establish the University of Chicago he had a careful survey made to discover the largest community whose needs could be served by such an institution. As it grew in usefulness he added more and more to its funds, until at the end of 20 years he made his final gift, which brought his total contribution to $35,000,000. He steadfastly refused to allow the university to be named after him, and its officers have always declared he never interfered with the appointment of its teachers or sought to criticize or influence what they taught.

"One of the most important elements which go to make up civilization is the progress of morality and religion," Mr. Rockefeller declared. He proved his belief in this by giving many millions to various religious institutions in this country, mainly of the Baptist faith. Often he declared his association with the church was the most important act of his life. A legend long circulated was that for years he could not measure with millions the amount of his possessions. This is hard to believe in face of the fact that from boyhood he was a most careful bookkeeper. Those closely associated with him have said that if he had kept all his gains and reinvested them instead of giving them away, he would have been worth $2,000,000,000 to $3,000,000,000.

In the Cleveland High School in 1853, John D. Rockefeller had as a classmate Miss Laura Celestia Spelman, daughter of a merchant of Akron, Ohio. He became devoted to her. They were married September 8, 1864. During half a century they shared an ideal life. Mrs. Rockefeller cared little for social activities outside of the circle of family friends and the church. She gave much attention to the bringing up of her children, to the work of church and Sunday school and to charities. She died, suddenly of heart failure on March 12, 1915, at Pocantico Hills, N. Y., while her husband was in the South. For several years she had been unable to go to church, and it was Mr. Rockefeller's custom to bring her notes on the sermons.

The Rockefellers had five children, one of whom died in infancy. The others were Alta (Mrs. E. Parmalee Prentice of New York); Edith, who married Harold McCormick of Chicago in 1895 and obtained a divorce from him in 1922, and died in 1933; John D. Rockefeller, Jr., of New York, who married Miss Abby Green Aldrich, daughter of former United States Senator Nelson W. Aldrich of Rhode Island, and Bessie, who died a number of years ago. She was married to Charles A. Strong, Ph. D., formerly professor of psychology at Columbia University.



Testifying during the dissolution suit, 1911, when he was 72

In their childhood years Mr. Rockefeller entered with zest into the play of his grandchildren. He never tired of teaching them to save and give.

At the celebration in honor of his eighty-first birthday, at which a band played his favorite songs for hours, the aged philanthropist declared that he hoped to live for 100 years.

"And then," he added, "I shall begin to really live."

Mr. Rockefeller attributed his long life to his temperate habits. No one ever saw him in a hurry. The chief of American business men, so noted as hustlers, he never hustled. He had a pulse well below 60, and no one can remember seeing him in a state of excitement. He never used tobacco or alcoholic beverages, ate moderately and very slowly, and took care to linger awhile at the table by playing with his household a game of numerica, a single puzzle of numbers somewhat like solitaire. The daily nap after luncheon and several hours of outdoor activity were his rule after the age of 34 years. He took up golf in 1899 and became a constant player all the year through. He played nine holes in 41 to 45 when well past 80 years old.

Mr. Rockefeller's home since 1884 was at No. 4 West Fifty-fourth Street, New York. He had a large estate called Golf House at Lakewood, N. J., and one called Kijkuit—old Dutch for Lookout—on a high hilltop among 2,500 acres at Pocantico Hills, above Tarrytown, N. Y. Here he built a beautiful mansion at a cost of more than $2,000,000. For years he had a summer place called Forest Hill, near Cleveland, Ohio, surrounded by 640 acres of lawns, gardens and groves. The house was burned in 1918 and was not rebuilt, after which Mr. Rockefeller never revisited Cleveland.

(Continued on Page 27)

"I believe it is a duty for a man to get all the money he honestly can and to give all he can." Mr. Rockefeller (at 82) walking with John D. Jr.

Trends Influencing t Gasoline Industry

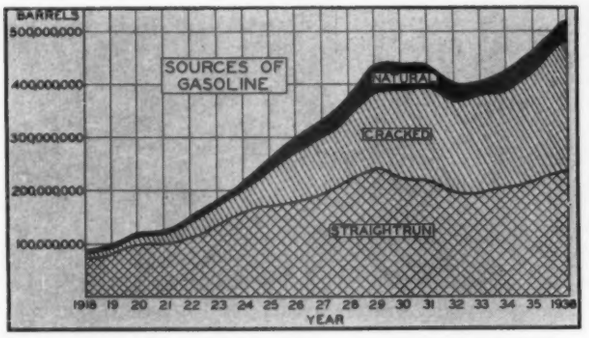


Fig. 1

No group within the oil fraternity is less able to shape its destinies than the natural gasoline division. In the interests of conservation it must build plants where the production department finds oil and gas, and the industry must sell the great bulk of its products almost if and when refiners need them.

On the surface your job of manufacturing natural gasoline is an inglorious one and you have probably considered it as such many times. But possibly you have worked so close to the routine as to lose perspective in properly evaluating it. You turn out close to a quarter of a million dollars' worth of products every day; you save the equivalent of 230,000 bbls. of crude oil daily and you manufacture a superior motor fuel component at a relatively low cost.

To that extent at least, the natural gasoline industry is contributing to the program of true and practicable conservation of our natural resources.

In this respect it may interest you to see in graphic form (Figure 1) just what proportion of the total motor fuel made in the United States has been natural gasoline; it may also interest you to see its importance compared with the quantity supplied directly from crude oil and recovered through cracking.

On this graph you will see, as you already know, that the great bulk of our motor fuel comes from crude oil in the form of straightrun gasoline or is made by cracking, but it is important to note that the course of natural gasoline production has tended to increase with time. While there

***N. G. A. A.*—Presented before the annual meeting, Tulsa, Oklahoma, May 19 to 21, 1937**

was a slight recession in its relative importance during 1931, 1932 and 1933, it is apparent that natural gasoline has since regained a portion of the lost ground, and at present natural accounts for approximately 9 per cent of the total motor fuel made.

On this graph, the most noticeable fact shown is that the quantity of cracked gasoline made, continues to forge ahead. But this is not being accomplished at the expense of natural gasoline.

As the demand for higher octane motor fuels becomes even more pronounced, and this seems to be generally anticipated, more and more of the straightrun gasoline will probably be reformed or cracked. Although this procedure tends to increase the quantity of light fractions available in the refinery, there is no evidence that this procedure will seriously affect the demand for natural except on the part of very large refiners.

This thought is based entirely upon experiences gained in the past wherein the rapidly rising production of cracked gasoline and refinery vapor-recovery gasoline has been accompanied by an equally impressive rise in the quantity of natural used.

The reason for this appears to be in the fact that as more volatile motor fuels are offered for sale by those refiners who are equipped to make and conserve all of the light fractions, other refiners who are not equally well equipped and who depend upon natural gasoline to supply the deficit, absorb proportionately more. In the working out of this program the result is a general increase in the volatility of the motor fuels offered throughout the United States, and apparently the trend toward more volatile fuels has not stopped.

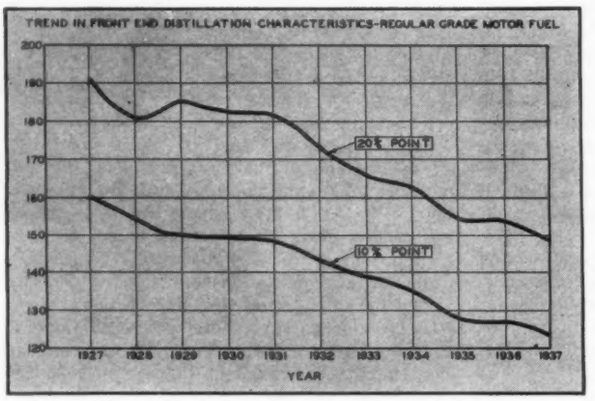


Fig. 2

To portray what has happened in this respect during the past 10 years, Figure 2 has been prepared to depict the trend in the 10 per cent and 20 per cent distillation points on what is considered average, regular grade motor fuels sold throughout the middlewestern states. These points have been chosen because they seem to offer a rough index of the relative quantity of natural gasoline contained in a motor fuel, or, at least, its relative volatility. Some refiners use these points for the control of volatility.

Motor Fuel Trends

The data covering the period from 1927 to 1930 are based on tests made on 34 samples of gasoline purchased from company-owned stations operating in Tulsa, including Phillips, Texas Co., Skelly, Pierce, Magnolia, Barnsdall, Sun, Shell, Marathon, Cities Service, Sinclair, Continental, Mid-Continent, Wilcox, Independent Oil, Tidal, National and Southland. It has been assumed that the gasolines sold by these companies in Tulsa were representative of those generally distributed throughout the Middlewest. At least that was before gasoline "swapping" became an important factor.

From 1930 to date the results shown in Figure 2 are based upon samples purchased from company-owned stations scattered through Cleveland, Chicago, Kansas City, Fort Worth and Tulsa, including those of the Standard of Ohio, Skelly, Cities Service, Continental, Barnsdall, Mid-Continent, Phillips, Sinclair, Magnolia, Gulf, Texas Co., and the Standard of Indiana.

The consistent decline in the temperatures at which 10 per cent and 20 per cent of the individual gasolines distilled, coupled with no suggestion of the trend stopping at its present level, leads to the conclusion that more volatile gasolines are in the making and that a larger quantity of natural gasoline will find a market over the immediate future, despite a continued increase in cracking and the recovery of vapors following reforming.

At this point, however, it might be well to point out the trend of motor fuel vapor pressures (Figure 3) the data for graph having been taken from the same set of distillation curves as were used in tracing the trend of the 10 and 20 per cent points. Here is shown the trend of vapor pressures on not only the regular grade, but on each premium grade and third grade as well. You will note that a drop occurred in the case of the regular and premium grade in 1937 for the first time, while the third grade remained unchanged.

It would not be safe to draw too definite conclusions from these data alone, but they seem to indicate that still more intensive stabilization of natural gasoline may be necessary in order to not exceed what appears to be a "high" of 11 pounds

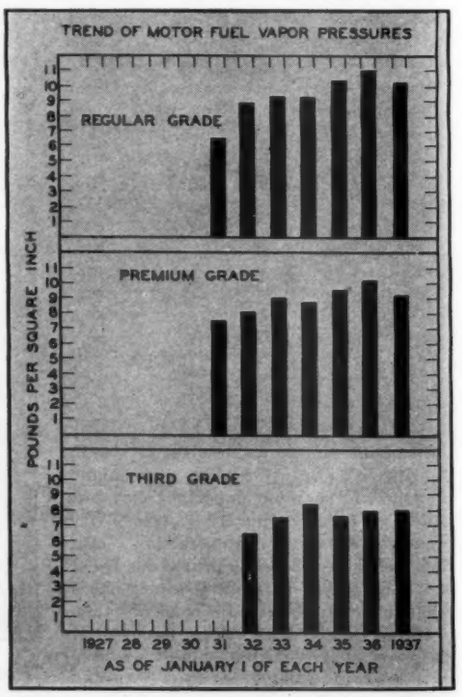

TREND OF MOTOR FUEL VAPOR PRESSURES
REGULAR GRADE
PREMIUM GRADE
THIRD GRADE
POUNDS PER SQUARE INCH
1927 28 29 30 31 32 33 34 35 36 1937
AS OF JANUARY 1 OF EACH YEAR

Fig. 3

the Natural

By W. T. ZIEGENHAIN

as the vapor pressure for average motor fuels while meeting the demand for a greater volatility as evidenced by the quantity of material wanted within the 10 and 20 per cent distillation points.

Thus far we have reviewed trends which have been brought about largely by change in refining rather than in the recovery of natural gasoline from gas. But a study of these trends is valuable since it reveals the degree to which refining is "synthesizing" motor fuels. And ahead of both the refining industry and the natural gasoline industry, we are now told, lies the possible and general application of dehydrogenation, polymerization and other means for tearing down the hydrocarbon molecules in the form of oil or gas to be recombined in some preferred arrangement to make a motor fuel of still greater utility.

I believe semicommercial and commercial-size units are now being built in the Panhandle of Texas and in Cass County in East Texas, near the Rodessa field, which will utilize natural gas and its products exclusively as charging stock to make practically finished motor fuels by such means. The results of these experiments will probably go far towards determining how generally natural gas will be used as a base material for the synthesis of motor fuels in the future.

Effect of Polymerization

Similarly, it seems only reasonable that these results will have a direct bearing upon the trend in natural gasoline plant construction over the future. Polymerization of gases may affect natural gasoline plant operations just as cracking has affected refining. Whereas the straight skimming plant operator has had to add cracking equipment to utilize the crude oil to best advantage, the natural gasoline plant operator may need to add dehydrogenation, polymerization or some other equipment to his plant in order to better utilize the hydrocarbons naturally present in the gas he processes.

It will probably take many years to effect such a change, and if it is to take place most economically, it will be necessary to operate such equipment only where there is an exceptionally large concentration of gas of a favorable quality. The processing of the gas in this manner will favor operating few but very large plants. While all of this is hypothetical, it is interesting to note that even under present methods of operation there is a distinct trend toward abandoning small gasoline plants and erecting a lesser number of large ones. Figure 4 shows the trend in this respect covering a period of the past 10 years.

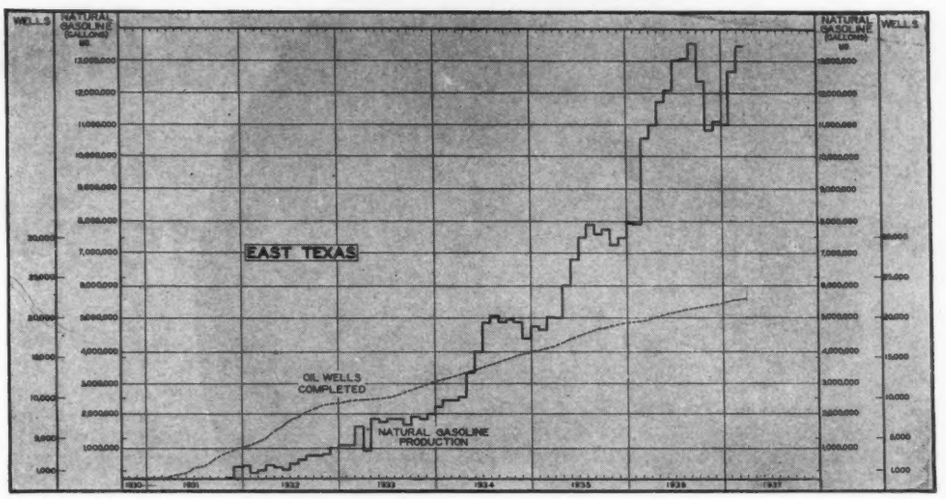


Fig. 7—Number of oil wells completed as compared with monthly natural gasoline production in East Texas

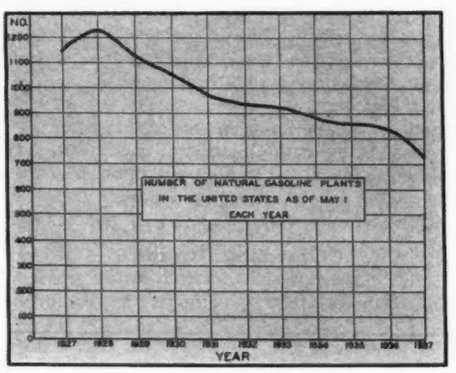


Fig. 4

To accompany this graph one has been prepared (Figure 5) which shows the trend in the capacity of the average natural gasoline plant in the United States. Both curves are based upon data resulting from a survey of all natural gasoline plants in the United States as of May 1 of each year. Here you will note the number of plants has declined from 1,200 in 1928 to a few more than 700 at present. You will also note that in the short span of 10 years the capacity of the average plant has jumped from 6,000 gallons a day in 1927 to 15,000 gallons today, an increase of 250 per cent.

Growth in Capacity

In order that the picture in regard to plants may be complete, Figure 6 has been prepared showing the combined capacities of all plants in the United States, and it should be encouraging to you as operators to see that despite all of the limitations placed upon your operations in one form or another, the facilities for producing natural gasoline now extend to the highest level of capacity in the history of your industry.

I should like to add one more chart, Figure 7, as part of this study of trends, but I can see no direct conclusions to be drawn from it that may be applied to the natural gasoline industry generally.

The data collected originally were expected to prove that there is a direct relationship between oil well completions and natural gasoline production. It early became apparent that the entire United States could not be taken as a basis for

(Continued on Page 18)

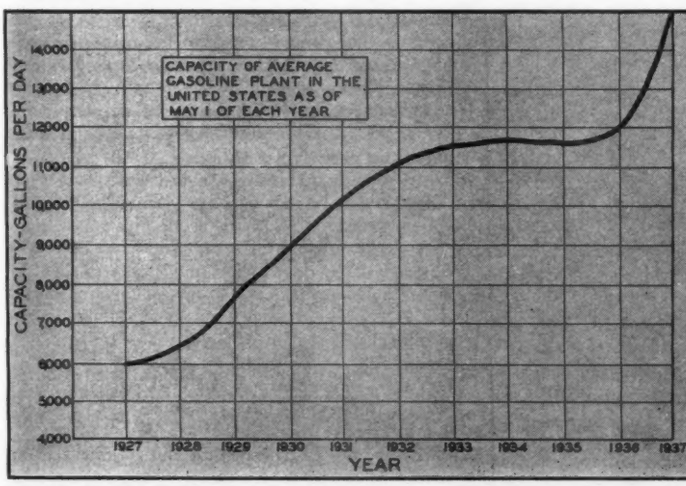


Fig. 5

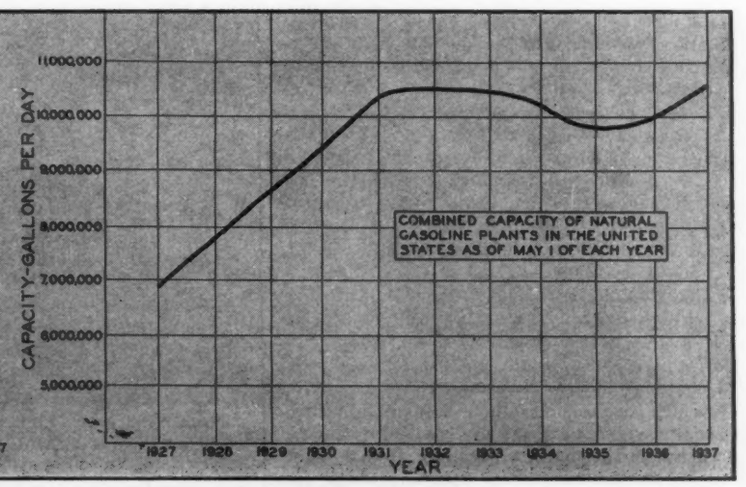


Fig. 6

New Processes Attention at

By C. O. WILLSON

NEW N.G.A.A. PRESIDENT—Joseph A. LaFortune, vice president, Warren Petroleum Co.

Natural gasoline manufacturers and allied interests at the annual Tulsa meeting last week made an inventory of their present position and took several looks into the future.

The six hundred registrants attending the annual sessions of the National Gasoline Association of America found little to complain about and much that was encouraging.

They were told, that their production steadily climbing, is approaching the peak levels of a few years ago. Enlarged storage programs and improved products have brought prices to higher levels and ended the wide seasonal variations, markets being particularly strong at this time. Speakers explained new developments in manufacturing practices and transportation methods which, coupled with expanded market outlets, should strengthen the position of manufacturers too often the "orphans" of the oil industry in the past.

From its inception the association has stressed the practical and technical phases of natural gasoline manufacture in all of its activities. This was never better exemplified than in the three-day program ending Friday. The discussions ranged from the simplest practical "kinks" of plant operation to the theoretical discussion of gas polymerization. This new art in motor fuel production, incidentally, promises to become as important to the manufacturers as to petroleum refiners.

Further emphasizing the importance of technical progress, the association for the first time gave recognition to individual achievement. The Hanlon award, established recently by E. I. Hanlon, veteran manufacturer and head of the Hanlon interests, was conferred on Richard Champney Alden, director of research for the Phillips Petroleum Co.

The citation issued in connection with the award lists the activities and accomplishments of "Dick" Alden as he is generally known to hundreds of friends. His work with the association included the chairmanship of committees and subcommittees which have found solutions to many problems of significance not only to the gasoline manufacturers but the oil industry generally. He has been a frequent contributor to the literature of the industry on technical subjects and has played an important part in directing the association's research program of several years standing.

Mr. Alden, a native of Pennsylvania, was graduated from Lehigh University in 1918, receiving a degree in electrometallurgy. He served as a second lieutenant in the Signal Corps of the United States army following graduation and later was employed by the Bethlehem Steel Corporation. He entered the oil industry in the Mid-Continent in 1921, his first employment being that of an oil field roustabout. He then was employed by operating and consulting companies engaged in the natural gasoline industry for four years. He joined the Phillips organization in 1925 and has since been engaged in research work. He is a member of several trade and scientific societies.

Operating Awards

Nine plant operators were awarded prizes in connection with the "Operating Kinks" contest of the Natural Gasoline Association of America last week. The following awards were made:

Grand prize: Noel Dalton, repairman, Phillips Petroleum Co., Edmond, Okla. "Liquid Level Control".

Class A. First prize, B. F. Gilstrap, chief engineer, J. E. Crosbie, Inc., Fittstown, Okla. "Fuel Injector"; second prize, Hubert Williams, chief operator, Phillips Petroleum Co., Pampa, Tex. "Lubricator".

Class B. First prize, H. E. Chambers, chief operator, Skelly Oil Co., Lyman, Okla. "Air Dryer"; second prize, A. E. McFarland, electrician, Skelly Oil Co., Carter Nine, Okla. "Electric Switch Controller".

Class C. First prize, E. L. Parkin, foreman, Glacier Production Co., Cut Bank, Mont. "Control of Scale in Cooling Towers"; second prize, C. E. Haines, plant superintendent, Shell Petroleum Corp., Orlando, Okla. "Tube Cleaner".

Class D. First prize, B. F. Gilstrap, chief engineer, J. E. Crosbie, Inc., Fittstown, Okla. "Automatic Thief Alarm"; second prize, S. H. Morris, engineer, Phillips Petroleum Co., Bartlesville, Okla. "Truck Derrick".

Awards were determined by a committee consisting of Anson W. Dwen, superintendent of gasoline department, J. E. Crosbie, Inc., Tulsa, J. R. Jarvis, manager, Lone Star Gasoline Co., Dallas, Vernon Wallace, engineer, refining department, Phillips Petroleum Co., Bartlesville, Okla. and C. H. Smith, Kansas Power & Light Co., Salina, Kans.

President's Address

T. R. Goebel, president, reviewed the work of the association and the present status of natural gasoline operations in opening the convention Wednesday afternoon. Taking an optimistic view of present conditions and probable future developments, Mr. Goebel, who retired as president after two years service, summarized the present situation as follows:

"The total demand for motor fuel is increasing faster than the present rate of increase of natural gasoline production.

"We should expect some further increase in the average volatility of motor fuel both in the United States and abroad.

"Increasing quantities of natural gasoline cease to be marketed as such and are being blended directly with the crude in the crude pipe lines.

"Increasing quantities of natural gasoline are blended with crude in export and coastwise cargoes.

"Heavy naphtha cuts from coastal and southwest Texas crudes absorb substantial percentages of natural gasoline in order to make the finished fuel suitable for automobile use.

"Cargo movements of natural gasoline, both coastwise and export have shown marked increases during the past year.

"There are fairly definite indications that a number of refiners who formerly bought only in the summer and fall are now buying throughout

OFFICERS FOR 1937-38

Joseph A. LaFortune, vice president of the Warren Petroleum Co., Tulsa, was elected president of the Natural Gas Association of America, at the close of the annual meeting Friday.

Other officers are: Vice presidents, R. E. Beckley, Standard Oil Co. of California, San Francisco; Ray E. Miller, Hanlon-Buchanan, Inc., Tulsa; J. R. Jarvis, Lone Star Gasoline Co., Dallas, Tex.

William F. Lowe was reelected secretary and treasurer.

Mr. LaFortune, who has been active in the work of the association for several years, was born in South Bend, Ind., and attended the University of Notre Dame there. During the World War he served at the naval air station at Rockaway Beach, Long Island.

His first experience in the oil business was with the Standard Oil Co. of Indiana, South Bend, in the accounting department. In 1919 he came to Tulsa and was first engaged in trade publication and association work. He was assistant secretary of the Mid-Continent Oil & Gas Association for one year. For the past 13 years he has been with the Warren Petroleum Co., serving as vice president for the past several years. He is also vice president of the Natural Gasoline Corp. and treasurer of the Du Mar Oil & Gas Co.

and Products Occupy N. G. A. A. Meeting

PRESENTING HANLON AWARD — R. C. Alden (right) receives watch from T. R. Goebel. His name first inscribed on plaque

the year and probably some of them are storing natural gasoline at refineries during the spring and early summer for use in their winter motor fuels."

History of Vapor Lock

G. G. Oberfell, vice president of the Phillips Petroleum Co. in a talk illustrated with charts gave a history of the developments which have to do with the vapor lock problem. He traced the changes in methods of manufacture including refining processing and the performance of the finished products in cars.

Several natural gasoline companies arranged for key operating men to attend the convention. Above is a group from the Empire Oil & Refining Co. Seated, E. R. Beckord, Dick Rogers, S. B. Crooks and H. L. Oder. Standing, P. J. Phillips, C. F. Fischer and D. G. Thoes

Mr. Oberfell has had a major role in the research and educational programs which has brought a more general acceptance of natural gasoline as an essential ingredient of finished motor fuels. In his talk he reviewed the outstanding developments including manufacturing methods, perfection of testing methods and cooperative studies which have brought changes in engine design. The net result as explained has been the acceptance of more volatile motor fuels containing the lighter hydrocarbons formerly largely wasted.

E. H. Shepard of the Chevrolet Motor Co. gave additional information on this same subject in which he explained the motor fuel requirements of present motor cars.

Value of Natural

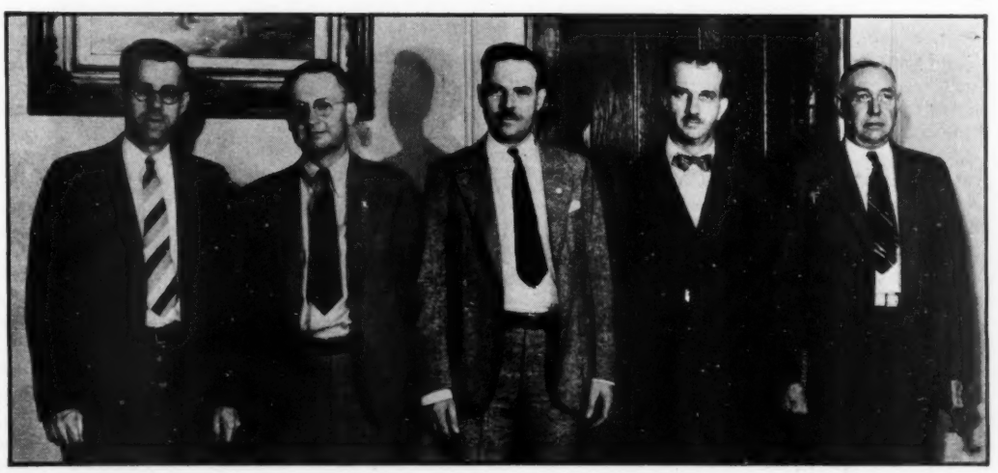
S. A. Giraud, chairman of the manufacturing committee of the Humble Oil & Refining Co. precipitated a renewal of the argument of long standing between natural gasoline manufacturers and refiners as to the value of natural gasoline as blending material in the production of motor fuels. Explaining that the value depended upon several factors which varied with the operating position of the buyers, presented a definite basis for calculation which took into consideration the properties of the gasoline and methods of manufacture. He said in part:

"In evaluating natural gasoline, it is first necessary to establish the cost to the refiner of improving the octane number and volatility of his gasoline production by naphtha reforming. There is shown in the following table the effect of the various steps in reforming upon the cost of the gasoline, octane number, per cent distilling at 212°F. and vapor pressure. Vapor pressures when required have been reduced to 10 lbs. Reid by discard of butane. It should be pointed out that these figures are quoted for comparative purposes only and should not be taken as the actual cost of gasoline.

"In Table 1, cost calculation, butane discard to fuel gas was credited at 80c per equivalent value of fuel oil on a B.t.u. basis.

"It is of interest to note in the above table the effect of butane discard on the cost of octane number and volatility improvement. For example, when going from (1) to (2), the cost of octane number improvement is about 0.032cts./gallon per octane number whereas in going from (2) to (3), this cost is increased to about 0.093c. Similarly, the cost of obtaining improved volatility becomes higher as discard of butane to fuel gas is required. The poor yield when reforming the heavy cracked naphtha is reflected in the increased cost of octane number and volatility, as shown for steps (3) and (4). The use of ethyl lead is, of course, competitive with naphtha reforming or recracking of cracked naphtha where volatility is not an important requirement of specifications.

"With the above basis data it is a relatively simple procedure to calculate the value of natural gasoline of any given vapor pressure as compared with the cost of gasoline when reforming either for volatility or octane number improvement. The following table shows the effect upon the relative value of natural gasoline for the various steps in the reforming procedure as outlined above on the basis of a required degree of volatility improve-



Natural Gasoline Supply Mens Association was host to manufacturers at luncheons and smoker. New officers: W. F. Lowe, secretary; V. C. Canter, Frick-Reid Supply Corp., treasurer; D. E. Fields, Tulsa Boiler and Machinery Co., vice president; Arthur J. Kerr, Midwest Equitable Meter Co., vice president; D. W. McKay, Cooper-Bessemer Corp., president

ment. For example, the relative value of the natural gasoline in the first step, *i.e.*, when reforming crude naphtha up to the point of butane discard, was calculated by assuming that natural gasoline

TABLE 1

	Assumed cost of gaso. cts./Gal.	Oct. No. C.F.R.M.	Per cent distill. @ 212°F.	Reid V.P.
(1) No reforming	5.15	60.9	33.9	9.4
(2) Reforming natural naphtha to point of butane discard	5.25	64.1	38.0	10.0
(3) Reforming all available natural naphtha	5.54	67.2	42.8	10.0
(4) Recracking heavy cracked naphtha	5.75	68.9	45.4	10.0

would be added to the base gasoline with no reforming in an amount required to increase the per cent distilling at 212° F. up to the same value, that is, 38%, as would be obtained by this step of reforming. Differences in octane number of the gasoline obtained by the comparative methods when obtaining the necessary volatility improvement were adjusted by using tetraethyl lead.

TABLE 2

	Assumed cost of gasoline cts./Gal.	Relative value of natural gasoline at the refinery cts./gal. 12.5 lb.	18 lb.	26 lb.
(1) Reforming to butane discard	5.25	5.53	5.57	4.94
(2) Reforming all natural naphtha	5.54	7.26	6.67	5.81
(3) Recracking cracked naphtha	5.75	8.26	7.56	6.55

"It will be noted that in the first step of reforming the value of 18-pound natural gasoline is higher than that of the 12.5-pound and the 26-pound natural gasoline. This is due to the fact that, when adding the natural gasoline to the base gasoline to obtain the desired volatility improvement, it is necessary to discard butane when blending a stock having a vapor pressure higher than 18 pounds. It will likewise be noted that the value of the natural gasoline increases materially as the cost of obtaining volatility improvement by reforming becomes more expensive."

Speaking extemporaneously on Wednesday's program in place of Colonel E. O. Thompson who was unable to attend, Fred F. Ketchum, sales manager of the Owens, Libbey-Owens Gas Department told of the unusual operating conditions in the mountains of West Virginia.

Published Papers

Two papers presented at the meetings are published elsewhere in this issue. "Polymerization and What It Means to the Natural Gasoline Industry" by G. G. Brown and D. L. Katz, University of Michigan. "Trends Influencing the Natural Gasoline Industry" by W. T. Ziegenhain, The Oil and Gas Journal.

The papers by E. O. Bennett and C. R. Williams, Continental Oil Co. on "Combined Crude Stabilization, Natural Gasoline and Pressure Maintenance Operations" and by W. F. Fulton, United Gas Public Service Co. on "Precision Gas Analysis" were published in the May 20 issue of The Oil and Gas Journal.

Committee Reports

J. W. Vaiden, chairman of the technical committee of the association reported that the combined Reid vapor pressure method of testing had been completed and would be passed on by the A.S.T.M. at its annual meeting next month. It is believed that the adoption of this method will solve one of the important testing problems of the manufacturers which has a direct relationship to yields and profitable operations.

Mr. Vaiden said the following studies are to be taken up by the committee:

1. Standardization of methods of analysis for natural gasolines and natural gases.

2. Development of a method for quick and accurate conducting of vapor lock road tests.

3. Further studies of the A.S.T.M., distillation test for natural gasoline.

4. Review of the present tentative standard specifications for liquefied petroleum gases.

Other committees reported on their activities over the past year.

As in the case of several annual meetings in the past, it was left to S. C. Carney of the Phillips Petroleum Co., to lighten the Thursday afternoon business session with a humorous talk on "The Role of Free Radical in Polymerization."

Dr. Francis to Cover Session of World Petroleum Congress

The World Petroleum Congress, to be held in Paris June 14 to 19, will be brought direct to the readers of The Oil and Gas Journal by Dr. C. K. Francis, technical editor. Doctor Francis will arrive in Paris several days before the opening of the congress and complete arrangements to report the proceedings of the six-day meeting.

As the official delegate of the International Petroleum Exposition he will extend an invitation to hold the next session in Tulsa in May, 1940.

The congress in Paris will bring together from all parts of the world several hundred of the petroleum industry's outstanding scientists, technicians and economists. Fifteen hundred delegates representing 30 nations will participate in the sessions presenting papers and discussions. The subjects cover the entire range of petroleum technology and economics under six heads: Geology and drilling; physics; chemistry and refining; construction and materials; utilization of petroleum products; economics and statistics.

DR. C. K. FRANCIS

Doctor Francis is eminently qualified to report and interpret to The Oil and Gas Journal's readers these symposia of practical value to operators in all branches of the oil industry. His connection with the petroleum industry covers 27 years of teaching, practical operation and writing. He is a graduate of Brown University and the University of Missouri, receiving the Doctor of Philosophy degree from the latter institution in 1910. He was appointed chief chemist of the Experimental Station of the Oklahoma A. & M. University at Stillwater, Okla., and later became professor of petroleum technology.

He was retained in a consulting capacity by several oil companies and devoted considerable time to field problems during the development of the Cushing pool. He terminated his connection with the university to become technical superintendent for Cosden & Co. After several years with that organization he joined the Producers & Refiners Corp. as vice president in charge of manufacturing. He continued in that capacity until the company was absorbed by the Prairie Oil & Gas Co. He then engaged in consulting work. He has been technical editor of The Oil and Gas Journal since 1926.

Doctor Francis is a fellow of the American Association for the Advancement of Science and a member of several technical societies and trade associations. He is acting chairman of the American membership of the Institution of Petroleum Technologists under whose sponsorship the Paris Congress will be held.

Stripper Well Meeting

The annual meeting of the National Stripper Well Association has been called by President William Bell of Robinson, Ill., at the Mayo Hotel, Tulsa, at 10:15 a.m., June 17.

THE MARKETS*

CRUDE OIL: *Eight-cent advance in posted schedules for East Texas crude reflects strength of crude market in that field where premium-paying has spread in recent weeks. Plan to reduce production in June, if carried out, will end additions to storage and strengthen market conditions in other areas.*

REFINERY: *Gasoline continues to show seasonal improvement in movement with Decoration Day week-end holiday starting summer consuming period. Demand for practically all grades of fuels heavier than expected and these products are strong in all areas. No general price changes in any product.*

TANK-WAGON AND SERVICE STATION: *No important changes with predictions of advances for next month in all grades of motor fuels.*

FINANCIAL: *Advance in East Texas crude prices brought further improvement in several stocks. Average of 30 representative stocks for week ending May 22: High, 41.31; low, 38.74; close, 41.26. Week ending May 15: High, 41.32; low, 38.79; close, 39.67.*

**Detailed information in Market Section.*

Careful Development Marking Goldsmith-Cummins Field

By NEIL WILLIAMS

Through cooperative efforts of the operators, the Goldsmith-Cummins field, northern Ector County, has become one of the most efficiently operated and controlled fields in West Texas. A systematic development program, put into effect during the early life of the field, is being carried out consistently, and completion and production practices designed to effect the greatest conservation of gas and reservoir energy, prevent waste and obtain the maximum recovery of oil are being followed.

Carrying out of a definite, field-wide conservation program is being facilitated by the recent organization of an engineering committee with a staff of engineers to assimilate field data and to consult with and direct or assist the operators in correction of improper conditions of common concern.

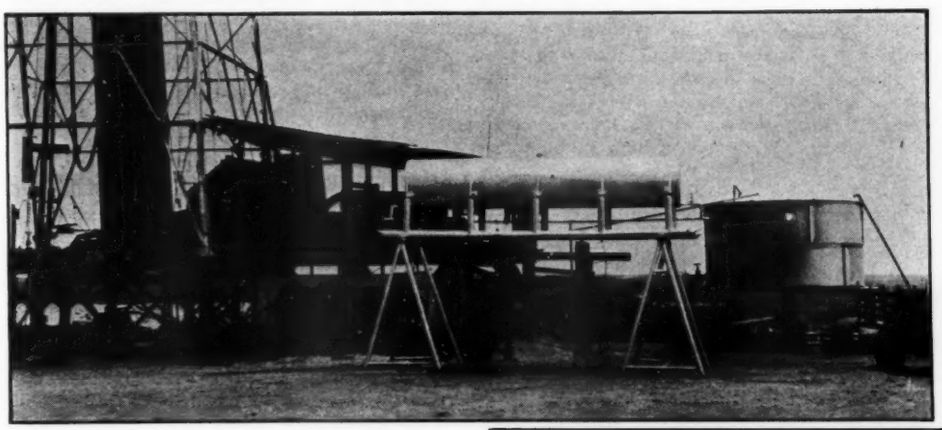
Rated as being the largest field opened in West Texas since Yates, it is assuming major importance. Extending more than 12 miles and from 2 to 4 miles in width, it covers approximately 15,000 acres, and has not yet been defined. On a late report there were more than 90 active operations with this number being increased steadily as additional strings of tools are moved in.

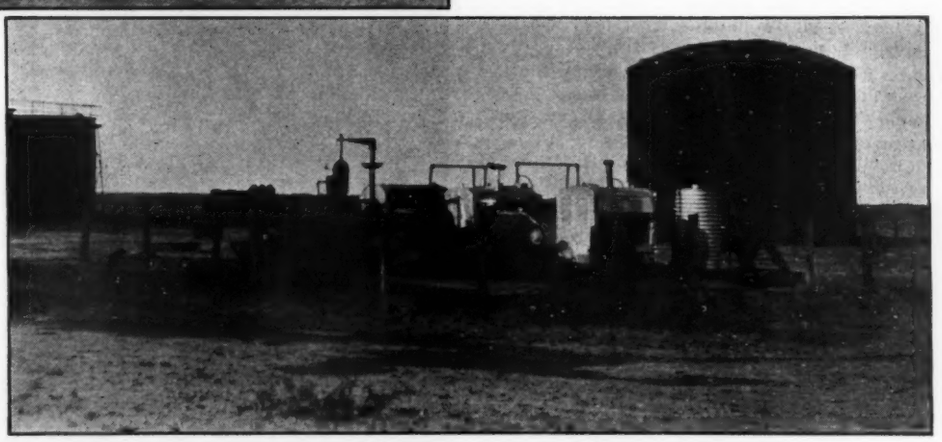
Principal development has taken place this year. Approaching expiration of lease terms has been the incentive for companies to undertake extensive drilling. On January 1 there were fewer than 25 producing wells with a daily production of less than 1,500 bbls., and less than a dozen operations under way. On May 15, there were 95 producing wells with a daily potential of 119,000 bbls. Based on the present rate of completions there will be 120 wells by June 1.

The field embraces what, until recently, has been considered four separate pools. On the extreme south end is the Pure-Cowden block of eight sections, in which Phillips Petroleum Co., the operator, holds a half interest. Next to the north is the Goldsmith ranch, held by Gulf Oil Corp. The Scarborough ranch of 15 sections adjoining the Goldsmith ranch to the north, is under lease largely by Landreth Production Co. On the extreme north is the Cummins ranch of 21 sections held by miscellaneous companies.

General interest first was centered on the area in May, 1935, when Gulf Oil Corp. (then Gulf Production Co.) completed its discovery well on the Goldsmith ranch. Previously, several small wells had been completed both on the Scharbauer and Cummins ranches at widely separated places. In the absence of a pipe line or other market outlet no drilling was undertaken around those wells.

Diesel rig operated by Olson Drilling Co. in Goldsmith field





Pump station Gulf Oil Corp. in Goldsmith field

The Gulf well, several miles from production on the Scharbauer ranch, had an initial production of more than 1,200 bbls., and with the laying of a pipe line by this company, impetus was given to development which has resulted in linking the different pools, and in proving the intervening acreage.

A 20-acre spacing program has been followed consistently. Unique to this field, however, operators have been given an option of two patterns, the first designated as a "staggered" spacing plan, and the other the conventional 20-acre spacing with locations as nearly as possible in the middle of 20-acre units, or 466 feet from the line.

The staggered plan calls for wells being in each alternate 10 acres, with locations spaced 330 feet from the line. This plan is of particular advantage in development of large tracts as it lends itself to more uniform drainage. While such spacing may result in irregular offsets with adjoining tracts on the regular 20-acre spacing, the disadvantage of this is partially offset by the wells being located closer to the property line. Also if ever desired, redrilling on a 10-acre pattern will be facilitated. In the conventional 20-acre spacing pattern with a well in the center of a 20-acre unit, it would be impossible to redrill on a 10-acre basis with any regularity of spacing.

Production in the Goldsmith field is obtained from the regular Permian lime pay at depths varying from 4,150 feet to 4,300 feet depending on structural position of the well and surface elevation. Elevations run from 3,100 feet in the south to around 3,200 feet in the north. Structural conditions have been found unusually uniform and adaptable for a definite, fieldwide program of conservation. A well defined free gas zone, or cap, immediately overlies the oil zone with the gas-oil contact established at minus 970 feet to 980 feet subsea. Top of the gas is around minus 500 feet at the highest point encountered. The water level has been determined at minus 1,070 feet, although in a few wells water has been found as high as minus 1,060 feet. This leaves an interval of between 90 and 100 feet for the oil zone.

Every effort is being directed toward control of the gas overlying the oil zone and prevention of its dissipation. Field regulations require the production string be set and cemented with the bottom not higher than the gas-oil contact so the free gas zone will be cased off entirely. If an oper-

ator is unsuccessful in accomplishing this, and a high gas-oil ratio well results, corrective measures are taken immediately.

Setting of a formation, or tubing anchor packer, is usually undertaken for cutting off the gas. Such a packer, run in on the tubing, is set in the formation below the level from which the gas is coming. Unless the formation is too porous or broken, such a packer provides an adequate seal from the upper gas.

Immediate steps also are taken to plug off any water. Every care possible is exerted to complete wells above the water level, and, when possible structurally the wells are completed sufficiently high so there will be no immediate danger of water encroachment. Only a negligible quantity of water has been produced so far, and there are only four wells making any water at all.

Water shut-offs are being accomplished either by plugging the bottom of the hole with cement or lead wool, or by use of formation packers run on tubing as they are run for correction of high gas-oil ratios. In water shut-off they are sealed off against the formation near the bottom of the oil zone above where the water is coming. The tubing, run to bottom, is perforated above the packer in the oil zone to permit entrance of the oil into the string.

Field rules require at least two strings of pipe be set and cemented. Three strings, including the first surface casing, an intermediate string, and the production string, are run in wells in high gas pressure areas. In the two string program, the surface pipe, varying from 8⅝-inch to 12½-inch size, must be set and cemented not higher than 180 feet below the surface to shut off shallow water horizons. This string is cemented by the pump and plug method with sufficient cement to fill the annular space to the surface. The production string, usually 7-inch casing, is set below the gas-oil contact and cemented with sufficient cement to fill the annular space behind the pipe a minimum of 900 feet above the shoe.

In the three-string program in high gas pressure areas, larger pipe is used for the first string, up to 15½ inches. For the intermediate string from 1,400 to 1,500 feet of 8⅝-inch to 13¾-inch pipe is used, cemented with about 250 sacks of cement. The production string is set and cemented as in the two-string program.

Because of the hazards from high gas pressures, only new, or thoroughly reconditioned casing is used. All pipe is adequately tested after run according to rigid specifications, and if leaks are found that cannot be corrected, an additional string of pipe is set and cemented.

Drilling is being done practically 100 per cent by contractors. Although some cable tool outfits are working, the bulk of the drilling is done with rotary. Due to the pressures, contractors are required to provide only the most adequate equipment of the semiheavy duty type. Among the rotaries are both steam rigs and various types of mechanical rigs, including full diesels, gasoline rigs, and diesel electrics.

Although water is not overly abundant, the water situation is not so serious at Goldsmith as in many West Texas fields. This has made possible a more general use of steam rigs. Water also is of a comparatively better quality than usual in West Texas. A privately owned company, however, has taken advantage of the fact most of the water is available along a narrow strip through the field, and has leased the water rights of this strip. This company has drilled the wells and has put in a central water plant, and is supplying water to a majority of operators.

Particular care is taken in completion of wells to prevent any contamination of the producing formation with drilling mud. All wells are drilled in either with cable tools or by the pressure drilling method using oil. On a rotary job, the hole is drilled to the pay using drilling mud, and the production string is cemented. If the well is to be completed with cable tools, the rotary rig is moved off and a cable tool rig substituted. Using the rotary to drill in, a pressure head is hooked up and the hole cleaned of drilling mud, which is replaced with oil, before the plug is drilled.

Acid treating has been an important factor in Goldsmith completion practices. Nearly all wells are acidized at completion, aiding materially in boosting well potentials. Porosity of the lime pay at Goldsmith is uniformly above the average. However, use of acid has been advisable. Treatment for a well varies from 1,500 to 10,000 gallons although the usual treatment is around 5,000 gallons.

Shooting is done in some instances but it has been found this sometimes fractures the formation so greatly formation packers later cannot be set effectively for correcting high gas-oil ratios or water encroachment. When shooting is done from 100 to 300 quarts are used.

Reflecting the efficient production practices and the generally favorable structural conditions, the field is being maintained on a flowing basis.

There are only two pumping wells, one on the east edge and one in the north end. The east side pumper is making less than 100 bbls. daily and offsets one of the best wells, indicating it is in a localized tight area.

Rotary drilled wells are being completed in from 45 to 50 days with costs ranging from $45,000 to $48,000. Considerable attention is being paid by several contractors to development of means to speed up this drilling, although this drilling time is looked upon as good for West Texas, considering the hard formations. Greater unitization of equipment is being worked out by contractors to facilitate moves from location to location as several contractors have sufficient work lined out to keep them busy for at least a couple of years.

Potentials of wells range from as low as 100 bbls. daily for wells in areas of less porosity to as high as 6,500 bbls. daily for wells in areas of greater porosity. Allowables are based on acreage and potential factors.

Carrying the conservation program further, Phillips Petroleum Co. and Landreth Production Co. are starting construction of a 50,000,000-foot capacity gasoline absorption plant. All gas will be taken by the plant which, it is reported, will be one of the most efficient installations ever made. It also is reported a polymerization plant will be added later, and possibly a carbon black plant to operate on the last residue gas. The gasoline plant will be operated by Phillips Petroleum.

Because of the increasing development, Shell Pipe Line Co. is laying a new 6-inch pipe line from the field to connect with its main trunk line extending from Wink to McCamey and Houston. This line, 50 miles long, will be the second pipe line outlet. The other outlet is by Gulf Oil Corp.

WEST TEXAS SERIES

This is the second of a series of specially prepared articles dealing with the remarkable revival of development in the Permian Basin of West Texas and Southeastern New Mexico. The first article was published in The Oil and Gas Journal of May 20.

The material for the articles was obtained by Neil Williams, veteran member of the Journal's editorial staff who visited the principal fields of West Texas and New Mexico. Subsequent articles will deal with engineering and geological features of one of the industry's most active operating areas.

Anglo-Iranian Representative

Blank & Stoller

W. D. Brown of London has arrived in New York as American representative of the Anglo-Iranian Oil Co., succeeding M. R. Bridgeman, who has returned to the company's office in London.

NATURAL GASOLINE TRENDS

(Continued from Page 13)

this study because of the lack of uniformity among the various field operations. It was equally apparent that a relatively large area had to be chosen, and finally it was decided to follow the experiences in East Texas.

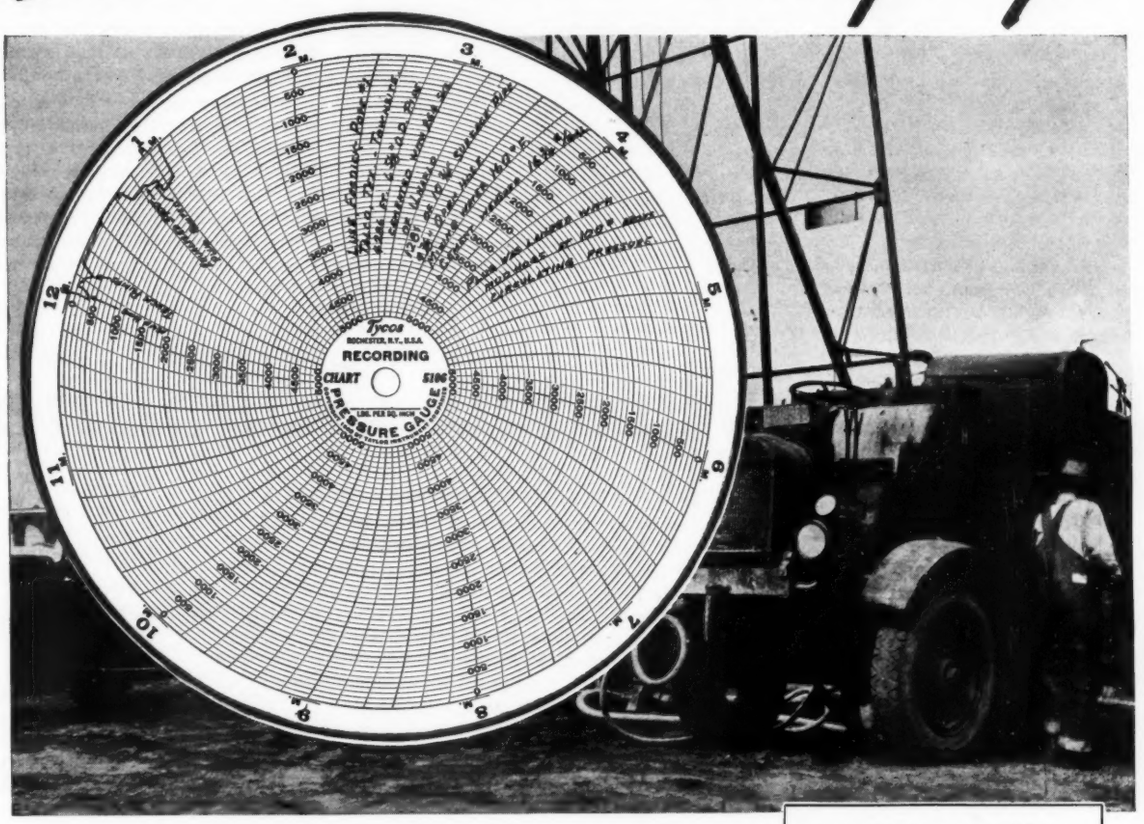
The number of wells completed month after month from 1930 to date has been plotted, and up to the present time more than 22,000 wells are accounted for. The quantity of natural gasoline produced in East Texas was then plotted. The incongruous fact was then revealed that there has been no relationship between well completions and gasoline production.

While it is true that it is necessary to complete wells in order to make gasoline, apparently other factors are of greater importance if you are to attempt a study of their relationship.

I shall not attempt to account for the great increase in natural gasoline production in East Texas during 1934, 1935, 1936 and thus far in 1937 and during a time when the rate of well completions was maintained rather constant, except to state that within that time the natural gasoline industry has made a more accurate appraisal of the gas resources in East Texas, has extended its gathering lines to more remote points with greater assurance of getting back its expenditures in pipe lines, has added greatly to the capacity of the plants in that field, has stabilized the crude oil in some instances and has also modified vapor pressure specifications to enable the plants to effect the most economical recoveries.

It may interest you to note that as a result the East Texas field accounts for almost 30 per cent of the total natural gasoline recovered within the state and the field is now second only to the Kettleman Hills and Panhandle fields in regard to production.

Less Water-Easier Pumping!



● On Luse-Fosdick, Pope #1, Talco, Texas, Unaflo cement was mixed 16¾ lb. per gallon. The mixing water was boiler feed water at 160°F. The depth of the well was 4286 feet. Yet the maximum pump pressure before landing the plug was only 460 lb. per square inch—only 100 lb. greater than circulating pressure.

Here again these facts were demonstrated: With Unaflo, an extremely heavy slurry can be pumped at extremely low pressures. Unaflo has a time safety factor which protects the well investment.

Designed especially for high temperature wells

Says one operator: "We found that Unaflo has a time safety factor which has on several occasions paid excellent dividends. Unaflo is easy to mix and pump with 40% consistency, and it remains fluid long enough to do the job, with extra time to take care of the unexpected that often happens on squeeze and plug-back jobs. Unaflo shows to best advantage in high temperature holes."

Unaflo forms a tight shut-off against water and gas. Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), Amicable Bldg., Waco, Texas · Kansas City · Tulsa · Oklahoma City.

UNAFLO CEMENT—

1. Gives you more time to get it down.
2. Remains fluid longer.
3. Follows irregularities of well bore and casing.
4. Hardens thoroughly with high density after it is placed.
5. Displaces contaminating elements in the well.
6. Not stiffened by mud contamination.
7. Not stiffened by salt water contamination.
8. Sets satisfactorily in sulphate water.
9. Requires no ice.
10. Makes squeeze and plug-back jobs easier, surer, more successful.

U-12

USS

UNAFLO

FOR SAFE DEEP-WELL CEMENTING

Natural Gas News

Trends in Consumption

Speaking on "Economic Trends in the Consumption of Natural Gas" before the Natural Gas Department of the American Gas Association at Kansas City, Mo., Dr. John W. Finch, director of the Bureau of Mines, presented the following facts:

The 10-year period from 1926 to 1935, inclusive, witnessed an enormous increase in the total consumption of natural gas as well as a widespread extension in market areas resulting from the construction of a network of long-distance pipe lines in the first half of the period. The total consumption of natural gas increased by 597,000,000,000 feet, or from 1,313,000,000,000 in 1926 to 1,910,000,000,000 in 1935. Preliminary estimates for 1936 indicate a possible consumption of over 2,170,000,000,000 feet. This figure represents an all-time peak and might very roughly be considered as the fuel equivalent of about 100,000,000 tons of coal.

To secure a truer perspective of the effect of this expansion in supply on the competitive fuel market, it is reasonable to deduct the amount used in manufacture of carbon black and as fuel in oil and gas field operations, a combined total of 610,000,000,000 feet in 1926 and 822,000,000,000 in 1935, an increase of 212,000,000,000. Deducting this from the total increase leaves 385,000,000,000 feet to represent the growth in domestic, commercial, and other industrial uses.

NATURAL GAS CONSUMPTION

By Districts and Uses

(In billions of cubic feet)

District:	1926	1935	Change
Appalachian	351	307	— 44
Field and carbon black	33	19	— 14
Domestic and commercial	199	155	— 44
Other industrial	119	133	+ 14
North Central	12	160	+148
Field and carbon black	4	3	— 1
Domestic and commercial	6	54	+ 48
Other industrial	2	103	+101
Southeastern	0	38	+ 38
Field and carbon black	0	0	0
Domestic and commercial	0	12	+ 12
Other industrial	0	26	+ 26
South Central	695	1,036	+341
Field and carbon black	422	669	+247
Domestic and commercial	58	102	+ 44
Other industrial	215	265	+ 50
Mountain	50	85	+ 35
Field and carbon black	27	21	— 6
Domestic and commercial	4	21	+ 17
Other industrial	19	43	+ 24
California	205	284	+ 79
Field and carbon black	124	110	— 14
Domestic and commercial	21	69	+ 48
Other industrial	60	105	+ 45
United States	1,313	1,910	+597
Field and carbon black	610	822	+212
Domestic and commercial	288	413	+125
Other industrial	415	675	+260

Source: U. S. Bureau of Mines.

The consumption for carbon black and field use represents approximately 43 per cent of the total consumption in 1935 and might deserve further consideration as to possible economics and greater efficiency in use in the event of a shortage in the natural gas supply.

Over 30 per cent (580,000,000,000 feet) of the total natural gas produced and marketed in 1935 was consumed in field operations in the production of oil and gas and in the operation of natural gasoline plants. This does not include gas treated for natural gasoline where the residue is blown into the air. The major part of the supply is casinghead gas produced in conjunction with oil and represents a readily available fuel which might otherwise be wasted. The low value of such gas in the field may result frequently in careless or wasteful use, but if it were not available a considerable quantity of oil would be required as a substitute fuel.

Somewhat less than 13 per cent (242,000,000,000 feet) of the total natural gas consumed in 1935 was used in the manufacture of carbon black. The average price paid for residue gas by carbon black companies is less than 2 cents per thousand. Carbon black plants are centered in the Texas Panhandle where they are restricted to the use of sour residue gas with no other outlet. The pipe line companies prefer the sweet gas with a minimum of sulfur. Both groups seem reasonably satisfied with the present arrangement, but natural gas men interested in the Panhandle field should watch the balance between the supply and demand of both sour gas and sweet gas. The carbon black industry has been forced to migrate steadily westward, although some plants remain in Louisiana. Approximately 50 per cent of the total production of 2,278,000,000,000 feet of gas in the Monroe-Richland field from 1916 through 1935 has been used in carbon black plants. A further westward move to West Texas and New Mexico is possible but that would only postpone the inevitable choice of several alternatives, the supplanting of carbon black by a cheaper product, a greatly increased yield of black, or higher prices. Cheaper products, such as "black" from the burning of oil have made little progress yet, but who can say as to the future? The present yield of carbon black of less than a pound and a half per thousand feet of gas is appallingly low in a theoretical sense. The pinch of increased costs has produced greater technical discoveries than the complete solution of the carbon black problem.

The consumption of natural gas for domestic, commercial, and other industrial purposes (except for field use and carbon black) represents the volume of gas which enters the competitive fuel market. The total for this group was 703,000,000,000 feet in 1926 and 1,088,000,000,000 in 1935. The interstate shipments of natural gas bear a significant relation to these figures. Interstate shipments, ex-

Natural Gasoline

Liquefied Gas Sales Increase

The market demand for liquefied petroleum gases, exclusive of exports, increased 38.8 per cent in 1936 compared with 1935, according to reports submitted to the U. S. Bureau of Mines. Sales of liquefied gases for domestic use, gas manufacturing, industrial fuel and chemical manufacturing, and fuel for internal-combustion engines totaled 106,652,000 gallons in 1936 compared with 76,855,000 gallons in 1935. Exports of liquefied petroleum gases increased from 4,237,000 gallons in 1935 to 4,897,000 gallons in 1936, a gain of 15.6 per cent. The market demand for propane, butane, propane-butane mixtures and pentane for the years 1930-1936 was as follows:

Year—	Propane	Butane	Propane-butane mixtures	Pentane	Total
1930	11,500	.....	*6,517	....	18,017
1931	15,000	.....	*13,770	....	28,770
1932	15,182	14,662	3,417	854	34,115
1933	15,835	19,056	3,226	814	38,931
1934	†18,681	25,553	†10,271	1,922	56,427
1935	†26,814	34,084	†13,492	2,465	76,855
1936	36,502	47,455	20,120	2,575	106,652

*Butane, propane-butane mixtures and pentane.
†Revised figures.

A review of the market requirements for the various liquefied gases shows that sales of propane increased from 26,814,000 gallons in 1935 to 36,502,000 gallons in 1936, a gain of 36.1 per cent. Deliveries of butane, which are larger in volume than any of the liquefied petroleum gases, increased to 47,455,000 gallons in 1936, or 39.2 per cent over the 1935 total of 34,084,000 gallons. Sales of propane-butane mixtures, ranking third in relative volume, gained 49.1 per cent in 1936. The demand for pentane in 1936 was limited to 2,575,000 gallons, a quantity only slightly above the 1935 deliveries.

C. E. Brock and C. H. Smith of Kansas Power & Light Co., and S. S. Smith of Shell Petroleum Corp. at the N.G.A.A. meeting

Texas March Production Higher

During March in Texas, the readjustment of operating conditions which started in February continued, resulting in substantial changes in disposition of gas produced, according to a report prepared at the direction of the Texas Railroad Commission for that month. Total monthly production of dry gas for the state was 55,531,725,000 feet as compared with 49,510,754,000 feet in February, 1937, and 55,125,750,000 feet in March of the previous year. The Panhandle accounted for 41,396,625,000 feet of March's output, some 4,500,000,000 feet more than in February.

The gas produced during March was disposed of as follows: Light and fuel, 34,276,371,000 feet; gas lift and repressuring, 1,332,530,000 feet; miscellaneous lease operations and drilling, 1,435,736,000 feet; and to gasoline plants, 18,487,088,000 feet.

Gasoline plants during the month processed a total of 63,772,580,000 feet of gas of which 27,464,853,000 feet were casinghead gas, 20,100,400,000 feet dry, sweet gas, and 16,207,372,000 feet dry, sour gas. From these gases a total of 52,364,156 gallons of natural gasoline was extracted or an average of .82 gallon per 1,000 feet of gas. Carbon black plants processed a total of 22,244,422,000 feet during March, from which was produced 35,491,931 pounds of carbon black, an average of 1.59 pounds per 1,000 feet of gas.

Supply Men's Manual

This year the Natural Gasoline Supply Men's Association has published the third issue of the manual prepared for the engineers in the industry. Advertising has been eliminated and twice as much technical data has been included as there has been in either of the previous ones. The committee preparing the material has aimed to make the manual both accessible and valuable. Some of the material has not been previously published. The manual has been prepared for distribution to engineers and executives engaged in the manufacture of natural gasoline.

clusive of exports, totaled 210,000,000,000 feet in 1926, and 362,000,000,000 in 1935, and represented 30 per cent of the above sales in 1926 and almost 43 per cent in 1935. This percentage undoubtedly will increase as the interstate lines continue to develop their markets.

The increase from 1926 to 1935 for the above group was 385,000,000,000 feet. On a regional market basis, the Appalachian district showed a loss of 30,000,000,000 feet, while all other districts showed increases — 149,000,000,000 in the North Central district, 38,000,000,000 in the Southeastern district, 94,000,000,000 in the South Central district, 41,000,000,000 in the Rocky Mountain states, and 93,000,000,000 in California.

The Appalachian, South Central, and California districts may be regarded as long established market areas for natural gas. The North Central, Southeastern and Mountain districts may be regarded as newer market areas, involving keen competition and fuel substitution.

Gas Revenues Gain

Manufactured and natural gas utility revenues amounted to $76,613,000, in March, compared with $72,489,500 for March, 1936, an increase of 5.7 per cent. The manufactured gas industry reported revenues of $31,378,600, an increase of 1 per cent. The natural gas utilities reported revenues of $45,234,400, or 9.3 per cent more than for March, 1936.

Total sales of manufactured gas for the month were 32,786,600,000 feet, an increase of 4.1 per cent. Natural gas utility sales were 127,632,800,000 feet, an increase of 12.8 per cent. Manufactured gas sales for domestic uses, such as cooking, water heating, refrigeration, etc., were 2.5 per cent below March, 1936. Sales for house heating purposes, however, gained 11.9 per cent, while industrial and commercial uses gained 12.8 per cent.

Natural gas sales for domestic purposes showed an increase of 3.6 per cent for the month, while industrial sales gained 19.1 per cent.

Laredo Gas Case

WASHINGTON, D. C.—The Supreme Court has denied the motion of the state of Texas for dismissal of the appeal of United Gas Public Service Co. from rate orders fixing gas rates to be charged domestic consumers in Laredo, Tex. The court had previously noted jurisdiction in the case and arguments will be heard in the fall.

Lone Star Expansion

WASHINGTON, D. C.—The Lone Star Gas Corp. and Lone Star Gas Co., Dallas, Tex., has asked the securities commission for authority to purchase certain assets of Texas Public Service Co. and Texas Public Service Production Corp., of Austin, Tex. The assets to be acquired consist of natural gas production, transmission and distribution system properties owned by Texas Public Service group in the San Angelo area.

The commission will conduct a hearing in Washington June 1.

To Adopt Safety Rules

AUSTIN, Tex.—The Texas Railroad Commission, backed by a new law, will set up regulations facilitating detection of escaping gas, the cause of the explosion at the London school. A hearing will be held May 31 on rules requiring introduction of a malodorant in gas systems.

The commission also will formulate rules pertaining to construction and operation of automobile tank trucks and trailers used in transporting liquefied petroleum gas and storage containers.

Pipe Line Activity

Le Doux, Shreveport.

Welding a turn in 24-inch gas gathering line in Cass County, Texas, side of Rodessa field, being laid to serve Phillips Petroleum Co.'s proposed absorption - polymerization gasoline plant

Sinclair Prairie Valuation

A tentative valuation of $47,000,000 has been placed by the Interstate Commerce Commission on properties of Sinclair Prairie Pipe Line Co. (Oklahoma) used for common carrier purposes. The valuation, fixed for rate making purposes, was as of December 31, 1934. The commission placed a value of $50,667,351 on total owned properties and $47,018,440 on total used properties. The total owned properties include miscellaneous properties leased to other companies and $3,575,000 of property now out of service. Cost of reproduction new of the property owned and used for common carrier purposes was fixed at $41,697,580.

Humble Awards Contracts

HOUSTON, Tex.—Humble Oil & Refining Co. has awarded contract to Williams Brothers Corp. to lay approximately 20½ miles of 8-inch oil line from the Baytown refinery in Harris County to the Anahuac field in Chambers County. Contract was also awarded by the company to take up 8 miles of 6-inch oil line from Baytown to Barbers Hill. Five and one-half miles of this line will be relaid from Wallisville to Anahuac which will follow the same right of way as the recently completed gas line.

Great Lakes Progress

Construction on paralleling the 8-inch Great Lakes Pipe Line Co. line from Barnsdall, Okla., to Kansas City, Kans., with a second 8-inch line, is proceeding rapidly. The line from Osceola, Iowa, to Omaha, Neb., will be changed from 4 to 6-inch, and a 6-inch loop is being laid between Des Moines and Minneapolis-St. Paul.

Gulf Coast Line Completed

Williams Brothers, Inc., Tulsa, will complete the construction of 70 miles of 6-inch oil line for Barnsdall Oil Co. between Placedo field, Victoria County, and the refinery at Corpus Christi, Tex., by May 29. This work started April 20 and was completed considerably ahead of schedule largely through good organization and favorable weather.

F. Ray McGrew, retiring vice president in charge of the pipe line department of the Standard Oil Co. of Louisiana, was honor guest at two dinners last week. One was given by 240 employes of the company on May 21, and the following evening another was given by 600 of his business associates and friends.

Refinery Projects

Pure to Enlarge Refinery

HOUSTON, Tex.—Pure Oil Co. plans to spend approximately $2,000,000 at its Smiths Bluff refinery in an expansion program expected to get under way before the middle of the summer, it is reported. The plant was only recently enlarged by the addition of a new combination unit and a skimming unit. Thus when the work to be done is completed, which is expected to last six months, the plant will have a greatly increased throughput as compared with that of a year ago.

Louisiana Ethyl Plant

SHREVEPORT, La.—Construction will not begin until September 1 on the Ethyl Gasoline Corp. and E. I. DuPont de Nemours & Co.'s proposed $3,000,000 antiknock compound manufacturing plant at Baton Rouge, La., it was announced last week.

To Build Talco Refinery

SHREVEPORT, La.—Construction is to begin immediately on a new $10,000 plant in the Talco field for the Titus Refining Co., headed by Mikesell, Fraser and Davis, with C. B. Davis in charge. A two-stage distillation unit will give the plant a daily capacity of 3,000 bbls. One unit will be atmospheric and the other vacuum.

Eastern Merger

OLEAN, N. Y.—Stockholders of the Messer Oil Corp. of Bolivar, N. Y., voted a merger with Oil Valley Producing Corp. of Olean in a new company to be capitalized at $3,875,000.

The board of directors for the new corporation includes Forrest T. Dorn, of Bradford, Pa.; Edwin H. Letchworth, Seymour A. Knox and George F. Rand of Buffalo; Joseph G. Fischer, of New York; Duncan C. and William Sudenbury of Portville; John A. Messer and Albert L. Shaner of Bolivar, and Charles L. Davis, Edward H. Wright and Arthur E. Yahn of Olean.

TALK ABOUT PUMPABILITY

A 15.7-POUND CEMENT! As they mixed it, the slurry looked for all the world like jelly. "Just can't reach the bottom," they said. But it took exactly 26 minutes from the time the mud pumps started until 300 sacks of 'Starcor' were in position, in Houston Oil Company's McGregor No. 10, at Clarkwood—5725 ft. of 7-inch casing, 9⅞-inch hole, bottom-hole temperature over 150° F.

At the end of the job, pressures rose to only 1300 lbs., from a mud circulation of 600 lbs. That's pumpability—and that's 'Starcor'!

Remember, 300 sacks of 'Starcor' weigh 14 tons, so the column was unbalanced to just that extent. The cement had to be good, to permit placing with only 1300-pound pressure! Free-flowing, sure enough.

Free-Flowing at High Temperatures

'Starcor' is free-flowing under high temperature and pressure. On this job, it flowed 1130 ft. behind the casing, filling up all the cracks and crevices in the formation—flowed snugly close to the casing and then bonded. Result, a cementing job worth the time and money expended.

That's the kind of cement Oil Men asked for—a cement that does not set in the casing, no matter what the heat and pressure—a cement that flows so freely it can and does fill the entire annular space between formation and casing—a cement that sets normally, yet hardens rapidly once it is in position, bonding firmly to give you real protection.

For 'Starcor',* like 'Incor',* is truly an Oil Man's cement—made to measure for oil-well work. Use it on your next job—see the difference it makes. Lone Star Cement Corporation, Dallas... Houston. *Reg. U. S. Pat. Off.

TWO PORTLAND CEMENTS—BOTH MADE FOR OIL WELLS

Properties	'Incor'	'Starcor'
Greater pumpability	Free pumping at 15 to 16 lbs.	
Gel-like body	Reduces mud contamination; doesn't settle out	
Controlled setting time	Normal UNDER 140°	Normal OVER 140°
High early strength	Drill out 1 to 2 days	Drill out 2 to 3 days
Sulphate-water resistance	Good	Exceptional sulphate resistance

East Texas Crude Commands Highest Mid-Continent Price

The Magnolia Petroleum Co. advanced its posted price for East Texas crude oil on Saturday, May 22, to $1.35 per barrel, an 8-cent increase. For several months premiums or bonuses have been paid by independent refiners for East Texas oil, these bonuses netting the producer as much as 10 cents per barrel, but the average has been about 7½ cents. The companies posting prices have lost many hundred connections by reason of these bonuses, and Magnolia Petroleum Co.'s action in raising the price was for the purpose of retaining its connections.

The action of the Magnolia company was followed on the same day by Bell General Pipe Line Co., Root Refineries, Inc., Tide Water Associated Oil Co., De Soto Crude Oil Purchasing Co. and Atlas Pipe Line Co. Headquarters of most of the large companies were closed on Saturday, and it was not until Monday that Panola Pipe Line Co., Shell Pipe Line Corp., Texas Co., Sun Oil Co., Stanolind Crude Oil Purchasing Co. and some other buyers met the price, making it effective as of Saturday morning, May 22. Gulf Refining Co. and Sinclair Prairie Oil Marketing Co. made their announcements Tuesday, but made the price effective on May 22.

East Texas' old posted price of $1.27 per barrel was 7 cents per barrel higher than the posted price for North Central Texas 40-gravity crude. The new price gives East Texas operators a 15-cent advantage over their North Texas brethren. The new price is 5 cents per barrel higher than the Oklahoma-Kansas 40-gravity price; 8 cents higher than the Mexia district 40-gravity price, and 13 cents higher than the Louisiana-Arkansas price for 40-gravity oil.

Bureau of Mines Forecast of Demand

The daily average production of crude oil for June estimated by the Bureau of Mines as required to meet the demand is 3,336,000 bbls., or 33,100 bbls. higher than the daily average estimated for May, 1937, and 359,800 bbls. higher than actual daily production of June, 1936.

Crude oil production during the five weeks April 3 to May 8 averaged about 3,494,000 bbls. daily, the highest sustained rate ever recorded. Stocks of crude increased 6,774,000 bbls., of which 6,503,000 bbls. was in domestic grades. Daily demand for domestic crude in the five-week period was 3,308,000 bbls. The bureau's estimate for this demand was 3,264,000 bbls., a difference of only 44,000 bbls.

Motor Fuel

Domestic demand—The domestic demand for motor fuel in June has been estimated as 48,500,000 bbls., or 9 per cent higher than actual demand for June, 1936.

Exports—Exports of motor fuel for June have been estimated at 2,600,000 bbls., or 200,000 bbls. less than for May.

Stocks—Stocks of finished and unfinished gasoline amounted to 81,651,000 bbls. on March 31, 1937. According to the American Petroleum Institute these stocks were reduced by about 135,000 bbls. during April, placing stocks of April 30 approximately 8,000,000 bbls. higher than for the same date in 1936. However, this accumulation in stocks is roughly proportional to the increase in consumption and the estimated withdrawal from gasoline stocks in June, 1937, 3,950,000 bbls., is essentially unchanged from the estimate of June 1936.

Gasoline production—Benzol and "direct" sales and losses of natural gasoline have been estimated as 1,050,000 bbls., making the estimated production of gasoline 46,100,000 bbls. This is distributed among the districts as follows (thousands of barrels): East Coast, 6,780; Appalachian, 1,690; Indiana-Illinois, 8,000; Oklahoma, 3,080; Kansas-Missouri, 2,990; Inland Texas, 3,700; Gulf Texas, 10,190; Gulf Louisiana, 1,570; Inland Louisiana-Arkansas, 950; Rocky Mountain, 1,090; California, 6,060.

Crude Petroleum

Runs to stills—Natural gasoline consumption at refineries is estimated as 5.4 per cent of the total gasoline required, or 2,490,000 bbls. The yield of straightrun and cracked gasoline is estimated as 45.46 per cent, which, applied to the estimated straightrun and cracked gasoline production of 43,610,000 bbls., gives 95,930,000 bbls. as the crude required at refineries.

Imports—Runs to stills of foreign crude have been estimated as 2,600,000 bbls., 300,000 bbls. less than for May.

Exports, fuel and losses—Exports of crude have been estimated as 4,650,000 bbls., 150,000 bbls. more than for May. The estimate for fuel and losses has been reduced to 3,000,000 bbls., or 100,000 below May.

TABLE 1—ESTIMATE OF REQUIRED CRUDE OIL PRODUCTION BY STATES*

(Daily average in barrels)

State—	Forecast June, 1937	Forecast May, 1937	Actual production Mar., 1937
Texas	1,354,000	1,340,800	1,404,900
Oklahoma	625,300	622,700	650,800
California	585,900	583,300	594,400
Louisiana	252,000	249,400	241,600
Kansas	190,700	187,100	194,500
New Mexico	102,000	99,800	102,000
Pennsylvania	52,400	52,600	50,800
Wyoming	51,000	49,000	50,500
Michigan	38,400	34,900	37,400
Arkansas	28,300	28,500	26,100
Kentucky	15,700	14,800	16,000
Montana	15,400	15,200	17,400
New York	14,700	14,500	13,100
Illinois	12,800	12,500	13,200
West Virginia	9,700	10,500	11,000
Ohio	10,600	10,300	10,200
Colorado	4,800	4,800	4,600
Indiana	2,300	2,200	2,200
Total	3,366,000	3,332,900	3,442,700

*The amounts in this table have been calculated as the requirements for the months stated and are not intended to be calculations of daily average demand for the current year or for any period other than the months stated.

Texas Allowable Reduced

Daily allowable production for Texas, effective June 1, has been set by the Railroad Commission at 1,351,198 bbls., a cut of 58,833 bbls. from the allowable of May 1. The June 1 allowable also is 2,802 bbls. under the Bureau of Mines' estimate of daily market demand for Texas crude during June. Current production, based on the allowable May 15, is 1,448,701 bbls., which is 97,503 bbls. above the new allowable set by the commission.

ALLOWABLE PRODUCTION BY DISTRICTS

District—	Daily allowable June 1 (bbls.)	Daily allowable May 1 (bbls.)	Daily allowable May 15 (bbls.)
Southwest Texas	213,667	225,657	236,261
Gulf Coast	186,275	201,754	211,178
East Central Texas	76,269	79,570	84,197
Rodessa	35,068	40,583	42,666
East Texas	462,000	459,300	460,937
West Central Texas	65,460	65,350	67,903
West Texas	172,492	187,915	193,730
North Texas	61,000	66,528	68,012
Panhandle	78,967	83,374	83,817
Total	1,351,198	1,410,031	1,448,701

OBITUARIES

C. M. BULLOCK, who first came to Michigan from Ohio during early days of development at Muskegon in 1929-30, died recently. Mr. Bullock was head of the Crude Oil Co., which drilled several wells in the Muskegon field, and later of American Drilling Co.

C. A. RALPH, for many years associated with J. W. Leonard, Jr., Trustee, discoverers and major operators in the Crystal-Montcalm oil field of central Michigan, died of a heart attack recently at his home in Detroit.

JAMES GORDON EDGAR, 65, secretary, McLeod Oil Co. of Calgary, Alberta, died recently at Rochester, Minn.

ROBERT M. SANDS, 60, successor to the late Edward L. Doheny as president of the Petroleum Securities Co. and an executor of the latter's estate, was stricken with a heart attack and died within 15 minutes in a Harwich (England) hotel. With his wife and family he had attended the coronation ceremonies in London and later taken a motor trip through Scotland. He was a director of the Union Bank & Trust Co., Tide Water Associated Oil Co. and Los Nietos Producing & Refining Co.

ALFRED BROGDON, 38, Fort Worth, Tex., South Chester Tube Co., died last week from injuries in an automobile accident while en route to the East Texas field from Houston.

GENERAL GARNET HUGHES, C.B., C.M.G., D.S.O., prominently associated with the Brown Oil Corp. of Calgary, Alberta, died at Toronto, aged 56. He had a distinguished career as a Canadian soldier in the war, and as a civil engineer and financier.

HERBERT G. OFFICER, 48, supervisor of the land department of Amerada Petroleum Corp. and a resident of Tulsa for more than 18 years, died last week of pneumonia, in Monterey, Calif. He was a native of South Carolina and was with Prairie Oil & Gas Co. before joining Amerada in 1926. His record included a tour of duty with a Standard company in South America.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

John D. Rockefeller

The passing of John D. Rockefeller, Sr., severs a link with pioneer America, the America of hard work and frugal living, of self-reliance and self-respect. In any appraisal of the man this background from which he sprang is fundamental. Primarily, he was a product of his time.

Three generations have passed and many things with them. The generation of today, or that of yesterday, brought up in wholly different surroundings, the result of increasing industrialism, cannot understand the viewpoint of 1840. Its conventions seem primitive, crude and harsh to a more luxurious age.

But to Mr. Rockefeller that was the way of life, what he had been taught in youth, what he had found good in practice. It became a life-long creed. It cropped out in every utterance: simple, sincere faith in tested principles.

That foundation assured that he would be diligent in business but he had much more, a positive genius for management. This was shown in his rapid progress even before he entered the oil business. His orderly mind revolted at the confusion and waste he found in what was commonly regarded as a gamble but which his initiative eventually developed into one of the greatest industrial and commercial operations of all time.

More than that, he had vision and enterprise. He steadfastly held to his aim of producing a better product and, by economies, making it available to more consumers. The success of his example compelled emulation.

The greater efficiency and economy produced by improved organization in his own company pointed to like results that might be obtained through the elimination of competitive abuses by consolidation.

There our modern industrial system was born.

It was inevitable that smaller men crying "competition is the life of trade" should condemn the growth of a competitor but Mr. Rockefeller seeing uneconomic competition menacing the life of business sought to substitute order for commercial anarchy.

The development of American industry and business has justified his belief. The United States could not have become the world's leading nation had its industrial and commercial units not been able to consolidate for the accumulation of the vast capital required and the greater efficiency and economy resulting from mass production.

It was characteristic of Mr. Rockefeller that, confident he was right, he never quailed before criticism, and no man was more bitterly assailed. He lived to see himself better understood and his services appreciated.

In the first flush of industrialism in the 60's competitive practices became common which later were outlawed by public opinion or by statute. The American admiration for outsmarting a rival probably dates from that period. Mr. Rockefeller and his associates were a little smarter than the rest, hence the natural outcry.

That his success rested upon much more solid ground has been shown by the subsequent development of his vast enterprises, although subject to the strict regimentation of later days. It was his matchless genius for organization, not mere ability to outsmart a competitor, that made him the world's ideal business man.

Even his benefactions, unparalled in size and unrivaled in constructive purpose, are eclipsed by the material benefits he conferred upon his country and mankind.

Full Survey of East Texas Field at A. P. I. Meeting in Kilgore

By MITCHELL TUCKER

KILGORE, Tex., May 25.—The East Texas chapter of the American Petroleum Institute was represented by record attendance at its meeting in Kilgore on the evening of May 25. Election of officers for the coming year, and presentation of three very interesting and timely papers featured the meeting.

The newly elected officers of the southwestern district of the Institute at the recent Dallas meeting arranged and sponsored the East Texas program. W. S. Morris, field engineer for the East Texas Engineering Association, and vice chairman of the southwestern district for East Texas, had charge of developing and arranging the details. A. G. Levy, senior petroleum engineer, Texas Co., Shreveport, La., is newly elected chairman of the southwestern district, and R. D. Risser, division manager of Shell Petroleum Corp., Kilgore, chairman of the district advisory committee.

The excellent attendance and interest displayed was stimulated by the efforts of the committee in securing effective local and statewide publicity for the meeting. It was pointed out prior to the meeting that the purpose of the East Texas chapter is to provide a public forum in which local problems and production methods can be discussed. It is in no sense proposed as a technical club. Its membership is open to anyone connected with, or interested in, drilling, pipe line transportation, production, or natural gasoline manufacture. Discussions at future chapter meetings are not to be confined to operating problems alone, and special effort will be made to promote a more cordial understanding by the general public on the close economic relationship that exists between the petroleum industry and other lines of endeavor. Several civic leaders of East Texas were present. As a result of this revival in the East Texas chapter, the active membership has been greatly increased.

R. M. Bradbury, Houston Oil Co. of Texas, Pistol Hill, Tex. First vice chairman, East Texas chapter A.P.I.

L. C. Peters, district superintendent, Humble Oil & Refining Co. in the Kilgore and London districts, was the outgoing chairman of the chapter, and appointed a nominating committee in preparation for the election. Nomination was considered tantamount to election, and the committee's recommendations were as follows:

Chairman, Byron Meredith, division superintendent, Sinclair Prairie Oil Co.; vice chairmen, R. M. Bradbury, Houston Oil Co.; M. W. McVey, independent operator; L. H. Moore, Gulf Oil Corp.; secretary-treasurer, W. S. Morris, East Texas Engineering Association; assistant secretary-treasurer, G. P. Brainard, Jr., Shell Petroleum Corp. Advisory committee: Chairman, R. D. Risser, Shell Petroleum Corp.; L. C. Peters, Humble Oil & Refining Co.; D. B. Kiniry, Sun Oil Co.; C. D. Hubbard, Weaver-Crim Corp.; R. O. Garrett, Arkansas Fuel Oil Co.; George Kent, Hanlon-Buchanan, Inc.; J. E. Springer, Tide Water Associated Oil Co.; L. A. Detrich, Bay Oil Co.; E. N. Stanley, Texas Railroad Commission; L. G. Littlejohn, Snowden & McSweeney. Program committee: W. E. Schoeneck, Ohio Oil Co.; F. J. Mikesha, Gulf Oil Corp.; Frank Thyng, Oil Well Supply Co.; L. H. Mack, General American Oil Co. Membership committee: Jack Straight, Empire Oil & Refining Co.; J. J. Jenkins, drilling contractor and J. Randolph, National Supply Co.

A very complete survey of the East Texas field was included in the three carefully planned papers, which had as their joint subject, "Present and Future Production Methods in the East Texas Field." Two papers are presented elsewhere in this issue of The Oil and Gas Journal, and the third will be published at an early date.

W. S. Morris, field engineer for East Texas Engineering Association, delivered the first paper in which he presented perhaps the most complete outline of the East Texas field conditions made in recent years. He touched upon the early history, geology, pressures, withdrawals, and other pertinent statistics. He supplemented his paper with a rather complete bibliography on the previous literature of the field.

The second part of the program dealt with present and future pumping methods in the field, and was presented by George L. Nye and E. B. Miller, Jr., of Tide Water Associated Oil Co. Considerable stress was laid upon the need for and advantages of proper counterbalancing.

As a concluding part of the joint program, Riley Aucoin, engineer for Humble Oil & Refining Co., delivered his paper on gas-lift methods as applied to the East Texas field.

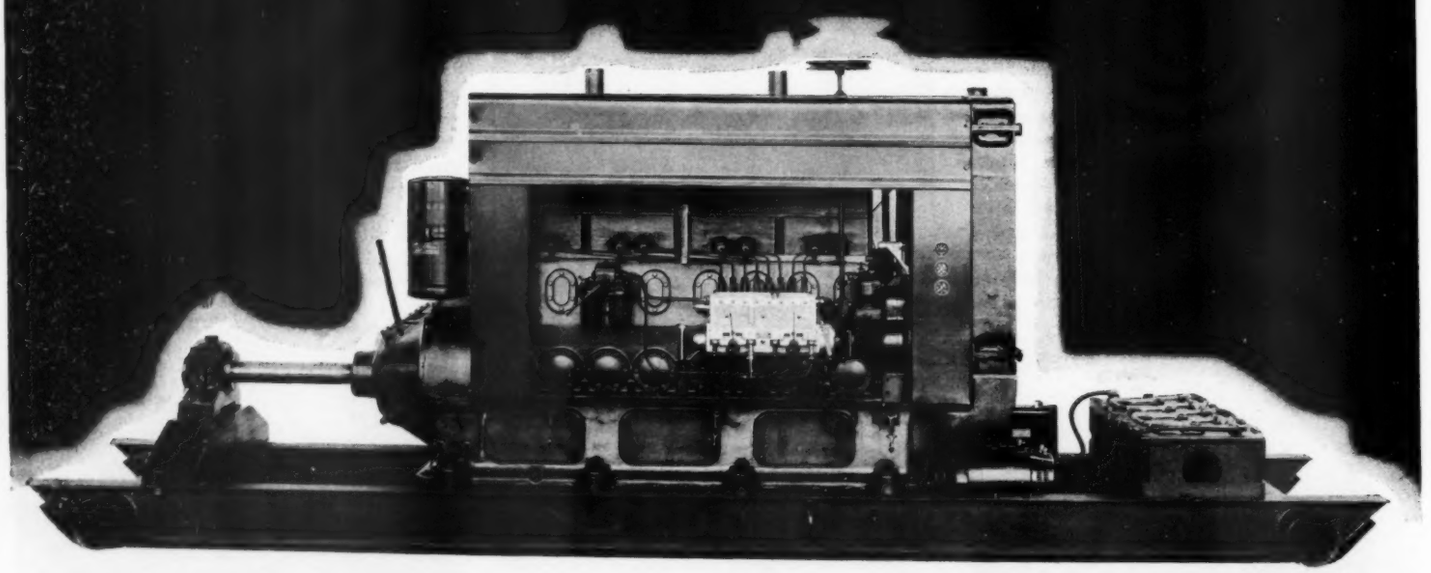
M. W. McVey, independent oil operator, Kilgore, Tex. Vice chairman East Texas chapter A.P.I. Division of Production

Byron Meredith, division superintendent, East Texas and Gulf Coast, Sinclair Prairie Oil Co., Kilgore, Tex. Chairman, East Texas chapter

Superior DIESEL
CABLE TOOL DRILLING UNITS

4½ x 5¾ bore and stroke—6 cylinder 43 to 100 H. P. at 800 to 1600 R. P. M.
4½ x 5¾ bore and stroke—8 cylinder 59 to 133 H. P. at 800 to 1600 R. P. M.

1. Extremely low fuel cost
2. Drilling Motion like steam
3. Flexible in operation
4. Pulls tools rapidly
5. Complete, compact, quickly erected
6. Dependable service at low maintenance cost
7. Thoroughly field tested



National

NSCO
REG. U. S. PAT. OFF.

THE NATIONAL SUPPLY COMPANY OF DELAWARE

DIVISION OFFICES: PITTSBURGH, PA., FORT WORTH, TEXAS, TULSA, OKLA., TORRANCE, CALIF. • MAIN OFFICE: TOLEDO, OHIO

JOHN D. ROCKEFELLER

(Continued from Page 11)

Mr. Rockefeller's brother William, who removed to New York from Cleveland in 1864 to take charge of their foreign oil trade, died at his estate near North Tarrytown, N. Y., June 24, 1922. He was nearly two years younger than his more famous brother, and had been in ill health for years.

The philosophy of John D. Rockefeller was simple. It found expression in few formal speeches, but he expounded it sometimes in informal talks to young men.

"I believe it is a duty," he often said, "for a man to get all the money he honestly can and to give all he can."

"Do all the good you can," was one of his favorite maxims.

"Be earnest. Do not be afraid to work.

"There is no feeling in this world, I think, to be compared with self-reliance, without which we can do nothing. Do not sacrifice it to anything else.

"Do not grow old before your time. Maintain an interest in life and in all living things.

"Live within your means. One of the swiftest toboggans I know of is for a young man just starting in life to go into debt.

"The true economy of life, I have found, is to discover the man who can do a particular thing—and then leave him to do it unhampered.

"Persevere. If you make a mistake, remember that it is human to err. Try again and try harder.

"A clear conscience is worth more and is a greater comfort than a great fortune gathered by dishonorable methods.

"Sons of wealthy parents have not a ghost of a chance compared with the boys who come from the country with the determination to do something in this world."

Detroit Investigation

DETROIT, Mich.—Upon petition of the Wayne County, Michigan, prosecutor, Duncan C. McCrea, a grand jury investigation into alleged conspiracy of Detroit public officials and others to maintain a monopoly and defraud the public was started last week.

The petition, granted by Common Pleas Judge Ralph W. Liddy, "to clear the air of rumors," and to permit "a fact-finding investigation to determine if there is any basis for the rumors" involves the granting of permission by Detroit city officials for the city to be served with Texas natural gas by Detroit City Gas Co., instead of with natural gas from Michigan fields.

Houston Franchise

HOUSTON, Tex.—A 2½ per cent gross receipts tax and sale of gas to industrial consumers only were demanded by Commissioner George B. Waters in a letter to the city council on the proposal to grant a 30-year franchise to Channel Gas Corp. The council gave the ordinance second reading, members stating they would give consideration to Waters' proposal before final action.

A 30-year franchise recently was granted Channel Gas Corp., but Mayor Fonville vetoed it. The council then passed the franchise over the veto but question was raised as to legality.

Mr. Waters said other gas companies are paying a 2 per cent gross receipts tax.

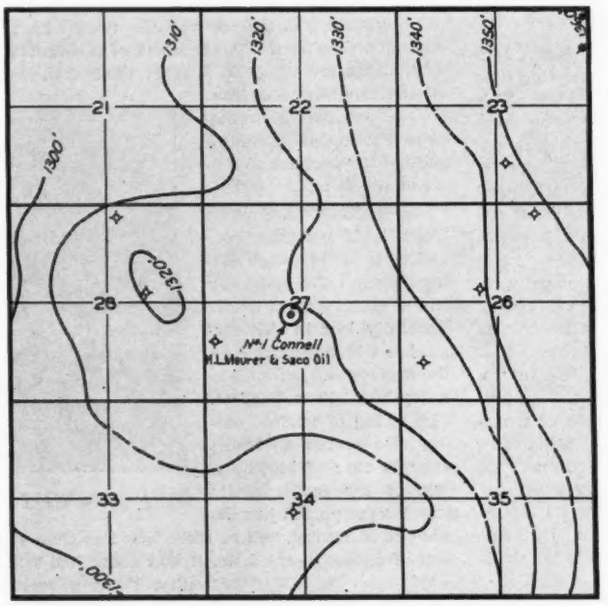
Dr. John W. Finch, director of the U. S. Bureau of Mines, Washington, D. C., and R. A. Cattell, chief of the petroleum and natural gas division, attended a conference of bureau employes at the experimental station, Bartlesville, Okla., May 17 to 22. Dedication of the new building in Bartlesville has been postponed until fall.

Unexplored Butler Area Lures Kansas Operators

By DAL DALRYMPLE

Butler County refuses to yield its position of prominence in the Kansas oil picture, and now is sharing in the revival of activity that has come to the older fields of the state. It has been the leader or among the leaders in Kansas oil-producing areas for many years and indications are it will stay in the top flight of oil counties for a good many years to come.

As far back as 1912 gas was discovered in the Eldorado area in Butler County and by 1916 it had become an oil-producing county. Discoveries at Eldorado, Augusta, Towanda, Douglas, Fox-Bush and other sectors in the county followed in rapid order. Butler soon took first place in Kansas, held that position for a considerable time and today, 25 years after the first strike, only such flush sectors as Rice, Russell and Reno counties surpass it in total daily production. The 2,902 producing wells in Butler County had a daily average production of 16,498 bbls. of oil during March—considerable oil yield for any 25-year-old producing area!



Wildcat test in section 27-29-5, east of the south end of Fox-Bush pool, southern Butler County, Kansas

With many new discoveries encouraging wildcatters and spurring development of the newer oil areas of western Kansas, Butler County was relegated to the stripper class and its activity waned almost to the vanishing point. Operations were few and largely confined to the proven fields, with only an occasional wildcat or extension well being drilled.

There were those who still had faith in Butler County, however. They believed that the Granite Ridge of Kansas, the axis of which passes in nearly a straight line across the county and through the heart of the Eldorado area, held many undiscovered oil pools—pools and producing formations that were overlooked in the heydey of the Butler County boom. They believed that with the aid of increased geologic information, modern equipment and up-to-the-minute drilling methods, these hidden pools would be uncovered.

So, when the stripper areas of southeastern Kansas experienced a revival in activity in recent months, those who believed in Butler County moved in and began anew the search for oil and gas in that prolific area. The result was that activity in Butler County now is on an ascending scale.

A few weeks ago Alf M. Landon, former governor of Kansas, returned from the political wars and reentered the oil business as an active operator. He chose Butler County for one of his first wildcat tests, and was successful. A few weeks ago he opened the McKaig pool in section 13-28-6e, in southern Butler County, on the Sallyard-Keighley trend. Much new activity resulted. The former governor is drilling or preparing to drill six or more wells on his 2,500-acre block around his discovery well. Other nearby tests have been started or are proposed by Sinclair Prairie Oil Co., National Refining Co., Westgate-Greenland Oil Co., and other operators.

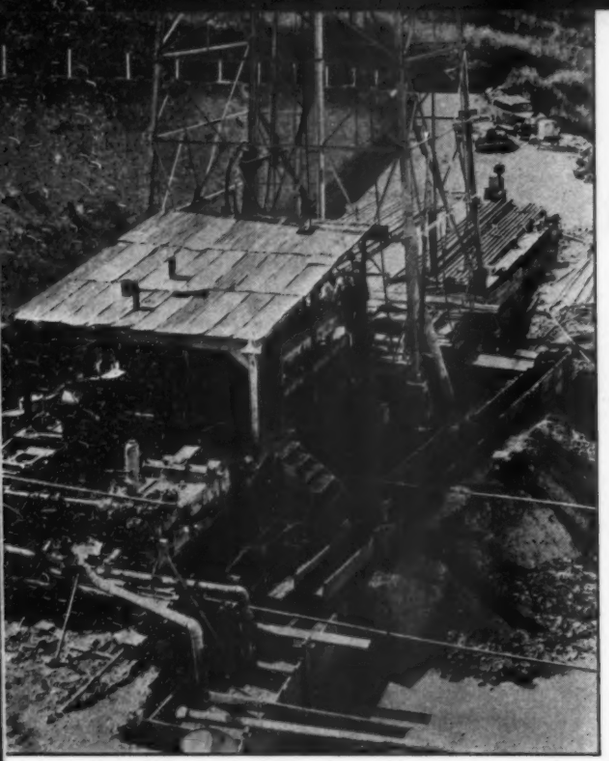
This discovery was a tonic for other Butler County enthusiasts. Louis Kahan and associates started a wildcat in SW NE section 27-23-4. Vickers Petroleum Co. is drilling a wildcat in NE NE section 32-24-4. At time of writing, these tests were nearing a decision. Kimmel & Stewart, Wichita operators, are reported to have staked location for a wildcat in NE SW section 15-26-6, between Eldorado and the Smock-Sluss pool.

Latest oil operator to return to the Butler County scene is Harry L. Mourer of Tulsa, who, with Saco Oil Co., is starting No. 1 Connell, NE SW section 27-29-5, west of the south end of the Fox-Bush pool. Mr. Mourer was a former president of the old Kansas & Gulf Co., which was successful in developing producing properties in Butler County 20 years ago, but he has not been active in that sector for many years.

Location for the Mourer-Saco test was made by F. G. Holl, Wichita geologist, on his geology and interpretation of a situation of the Golden Lane cross-trend of the Bartlesville sand, similar to that on which the Landon-McCaig strike was made. The accompanying map, showing location, was drawn on surface structure contours on top of Fort Riley limestone. Logs of tests drilled in 1920 and 1927 in SW SW section 26-29-5 and SW NW SW section 27-29-5, found Bartlesville sand and bailed free oil from that formation. Tests to the northwest and nearer the Fox-Bush pool also found some free oil and gas in Bartlesville sand. The area long has been attractive to prospectors.

Active operations in Butler County the past week included two rigs and 12 drilling wells, in addition to several locations at which work had not started.

Unusual Operating in Capitan Field of



Shell's portable drilling rig used in Capitan field. Power is furnished by two natural gas engines which can be compounded to operate the drawworks

The Capitan field of Santa Barbara County is probably the most outstanding field of California from a scenic point of view. This feature has had considerable bearing upon operations in the field, since it is primarily the mountains and the ocean which give the district its pleasing appearance, and both have influenced development and production. The presence of the mountains is felt most intensely when it becomes necessary to provide a location for a new well and build a road to the new location. This usually requires a great expenditure for leveling off a small area on a steep slope. At present one location is requiring the excavation of over 25,000 cubic yards of earth at a cost of about $5,000. Unlike the mountains, the ocean is a help rather than a hindrance. It provides a convenient means of transporting the crude oil to the refinery, practically eliminating the use of pipe lines and pumps.

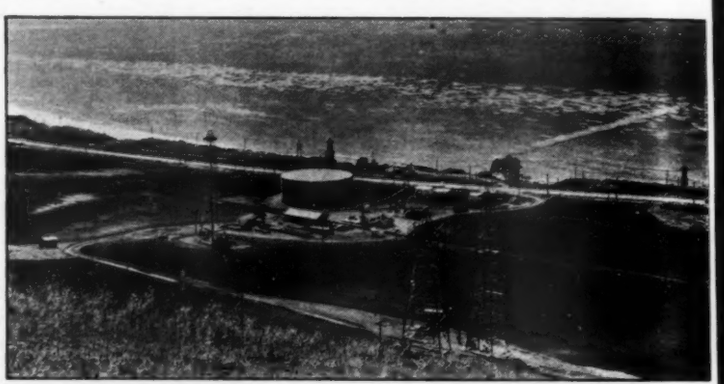
The Capitan field has many other points of interest besides its mountains and ocean. Its geology is unusual. Also, drilling and production work, such as Shell Oil Co.'s organization of drilling procedure, its unique method of completing wells in the Sespe formation, and its operation of flowing and pumping wells, all show results of the scientific thought and research which has concerned the oil industry in the last decade.

There are two productive zones in the Capitan field. The more prolific horizon, occurring at an average depth of 1,200 feet, is known as the Vaqueros, and is of Miocene age. The deeper zone is the Sespe formation of Oligocene age in which there are two pay sands, the upper of these usually being found at a depth of about 2,400 feet. Depths vary greatly because of the irregular surface. The structure is a fairly regular dome which is faulted on the north. To the north of this fault the formations are tilted up sharply toward the axis of the mountains so that both productive formations outcrop within half a mile of the productive limits of the field.

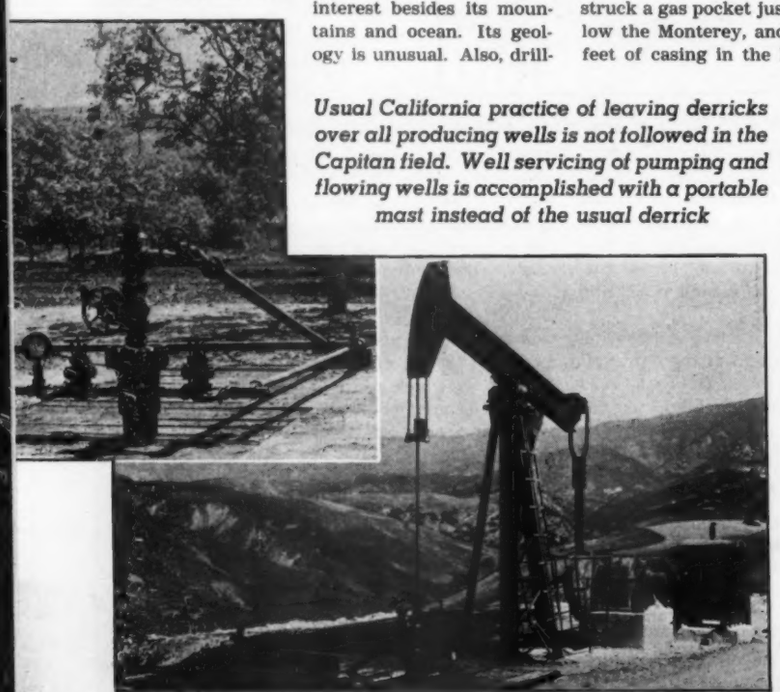
In drilling all Capitan wells it is common procedure to set 11¾-inch casing through the Monterey shale, since circulation is generally lost in this formation which outcrops on the surface and is found to a depth of 300 to 900 feet. The string of surface casing also serves as insurance in case of blowouts. One of the earlier wells struck a gas pocket just below the Monterey, and as there was less than 100 feet of casing in the hole, it was controlled with difficulty. For a Vaqueros well, 8⅝-inch casing is cemented on top of the sand, the casing point being selected by coring. The sand is then drilled to a chosen depth safely above the water table and a core is taken in the bottom of the hole to make sure of the position. Before the conditions were understood the entire sand section was cored, but since it has been established that the water table is horizontal, this is unnecessary. In completing a Vaqueros well a perforated liner is hung in the casing to cover the exposed sand.

In drilling Sespe wells the 8⅝-inch casing is cemented over the first productive zone in the Sespe formation. Below the Vaqueros, which is about 375 feet thick, the top of the Sespe formation is found at about 1,500 feet. The entire Sespe formation is made up of alternating sands and shale. The top 500 feet is known as the gas zone. Below this interval is a 150-foot water zone in which is the 20-foot sand, the best horizon marker of the field. Below the water interval is the first oil zone, known as Erburu 8 zone. It is about 100 feet thick, though much of it is made up of shale streaks. Below it is a 50-foot section of sand and shale carrying water. Another productive zone, known as the Erburu 10 zone because it was discovered by General Petroleum Co. No. 10 Erburu, occurs below the water interval, and is also about 100 feet thick.

It is readily seen that the complicated nature of the Sespe formation would necessitate out-of-the-ordinary well-completion practice. The gas zone and the water above the oil are, of course, cased off by the 8⅝-inch casing. The two zones are both produced in the same well where they are both productive, so the intermediate water between the two must be cased off with the liner. For this operation Shell Oil Co. has used an unique method on their recent wells.



Part of the field showing General Petroleum Corp.'s loading facilities.



Usual California practice of leaving derricks over all producing wells is not followed in the Capitan field. Well servicing of pumping and flowing wells is accomplished with a portable mast instead of the usual derrick

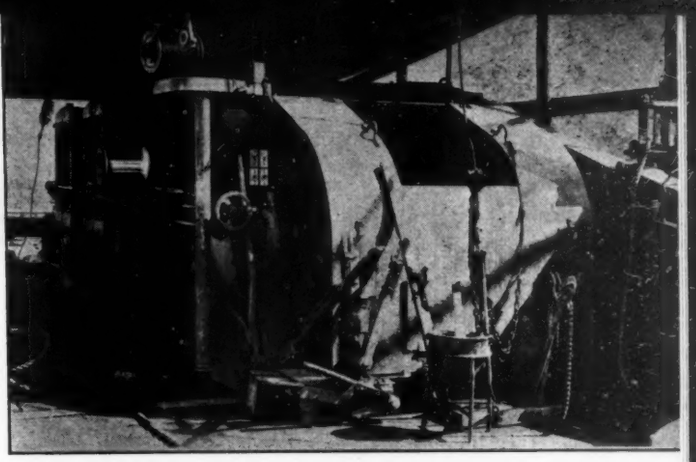
Cementing Off Intermediate Water

Coring is carried on continuously through the Sespe oil-bearing zones in order to obtain accurate measurements on the tops and bottoms on the two productive zones and determine the extent of the intermediate water-bearing zone. Using these measurements the liner is made up so that the sections opposite the oil-bearing zones will be perforated and a solid section will cover the water-bearing zone. A solid float-collar is installed in the liner just below the blank section, and above this a canvas basket assembly is used. On top of the blank section of liner an inverted basket assembly is installed. The liner is hung in the 8⅝-inch casing, and preparations are made to cement behind the solid section leaving the perforated sections open. This is done without cementing plugs.

With the hole full of mud the drill pipe is run in with a short tubing-sub at its lower end on which is installed several 6⅝-inch swab rubbers in an inverted position. These fit into the liner and prevent the cement slurry from coming up around

Conditions Found California

By T. P. SANDERS



New portable drilling rig being used in the Capitan field. In back of the hoist drum is a sand reel which is used for running the wireline core-barrel

the drill pipe inside of the liner. Before running the cement, a small quantity of water is pumped down the drill pipe to wash down the mud which would otherwise contaminate the slurry. Then the cement is introduced and followed up with mud. The cement comes out the end of the tubing sub, and since it cannot go downward because of the solid float collar and cannot go upward inside of the liner because of the inverted swab rubbers, it is forced through ports in the liner just above the canvas basket. The basket and the mud below it prevent the cement from going down outside of the liner, so it passes upward over the blank section of the liner.

At the top of this section it is diverted by the inverted canvas basket through ports back into the liner above the swab rubbers. A sufficient volume is used to make sure of placing good clean slurry behind the blank-liner section. The mud which is pumped down the drill pipe after the slurry is carefully measured by two tanks on the cementing truck, each of which hold 100 cubic feet. It has been found that very accurate control is obtained with this method.

The line of seaweed in the ocean marks the submarine line for loading

Washing Perforations

As soon as the cement is placed, the drill pipe is raised so that the swab rubbers are located in the top perforated section of the liner. Thin mud is then circulated in order to remove the excess cement from the hole. The mud goes through the perforations below the swab rubbers and comes back inside of the liner just above the rubbers. This circulation is continued for a considerable time, the position of the swab rubbers being frequently changed in order to clean the cement from all of the perforations. After the cement has been given time to set, the process is repeated, except that water is used for the washing fluid, and the perforations below the blank section are also washed. It is not necessary to wash the lower perforations with mud immediately after the cementing since there is no danger of cementing them.

The drilling program carried on by Shell in the Capitan field is notable for orderliness. Only one drilling rig is used, but two 122-foot derricks are available, so that when the rig completes one well it is moved immediately to the next location where a derrick has been erected and drilling can be started without delay. Recently in such a move only 36 hours elapsed after one well came in before drilling was commenced at a new location. Since boilers are hard to move in such rugged country, the steam rig was recently replaced by a portable rig operated by two internal-combustion engines. These use natural gas in this service.

Under normal drilling, one engine drives the rotary table while the other drives the pumps. These are compounded to operate the drawworks. An interesting feature of this rig is the sand reel which is built into the unit in a position just behind the hoist drum on the drawworks. The sand line is used to run the wireline core barrel.

All wells of the Capitan field, both Vaqueros and Sespe, are tubed before they are brought in. Flowing wells are provided with surface flow beans. Sespe wells are equipped with 2-inch tubing while 2½-inch tubing is used for Vaqueros wells since the Vaqueros wells are larger. Also, the Vaqueros oil is heavy, having a gravity of 20 degrees.

The Sespe oil might be called the direct opposite of the Vaqueros oil. It is unusually good oil, having a gravity of 40 to 42 degrees. Practically all of the gas produced in the field comes from the Sespe zone.

Probably there is not another field where the characteristics of the producing horizons differ so widely. The Vaqueros is one thick sand body with only a few thin streaks of shale, while the Sespe has two separate oil zones of alternating sand and shale, each about 100 feet thick. The Vaqueros has a horizontal water table at a depth of 1,280 feet subsea, while the Sespe has water fingering into the edge wells at various levels. The water in the Vaqueros is fresh, while the Sespe water is salty. An edge well drilled into the Vaqueros furnishes water for all lease uses except drinking. The Vaqueros zone is a marine deposit while the Sespe formation is believed to be a continental deposit.

There are 43 producing wells in the Capitan field, 23 owned by Shell Oil Co., 18 by General Petroleum Co., and two small tideland wells owned by Oakburn Drilling Co.

The water drive in the Vaqueros has considerable pressure, so these wells all flow where the penetration is great enough and the surface elevation is not too great. The Sespe wells flow except where water is produced.

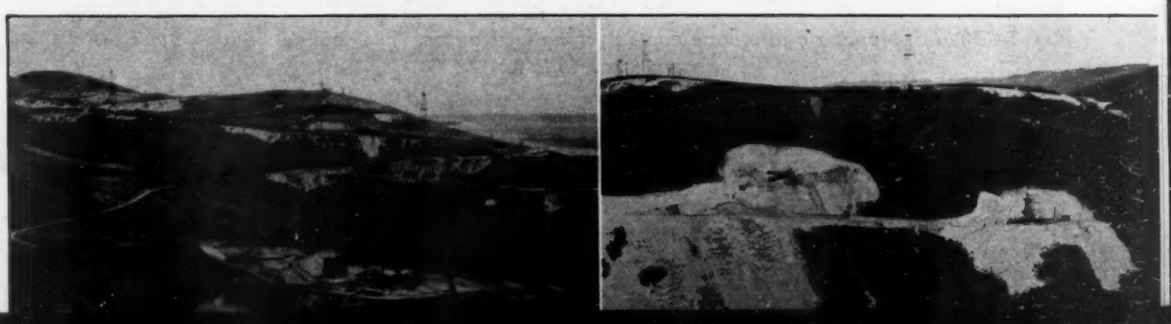
Both the oil and gas production from each well operated by Shell is metered daily, and production curves are kept up on individual wells. When a curve shows an abnormal increase in gas-oil ratio either the tubing is lowered, or in unusual cases, the paraffin is scraped out or other steps taken to correct the trouble. Each well has a trap or separator of its own, and this is equipped with gas and oil meters. From the traps the gas goes to the gasoline plant which strips the gasoline vapor from all the gas in the field, obtaining about 2,000 gallons daily from its input of about a million feet. The oil from each group of four or five traps goes to a tank battery which is equipped with a vapor system for delivering the gas liberated from the oil to the gasoline plant. There are five small tank batteries on Shell's property, and oil is run from these by gravity to a larger battery, and from there it is pumped to the field's main storage and loading system.

The loading of oil is accomplished with a submarine pipe line which goes out to a depth at which the tankers are able to anchor. A flexible hose on the end of the line is picked up by the tanker, and loading is done by gravity flow. The two widely differing types of oil produced in the field are mixed and form a crude of about 30 gravity.

California Liquefied Gas Sales

Liquefied petroleum gas sales made by California producers during 1936 totaled 23,646,248 gallons, according to a report prepared by the San Francisco office of the Bureau of Mines, this total being exclusive of export shipments amounting to 71,934 gallons. Total domestic sales of the various liquefied gases were reported as follows: propane, 5,434,260 gallons; propane-butane, 6,145,420 gallons; and butane, 12,066,604 gallons. Of the total consumed, 12,307,910 gallons were used for internal-combustion-engine fuel and 6,134,290 gallons sold as bottled gas.

Two views of the field showing some of the work necessary to build roads and make well locations. On the right a steam shovel and trucks are shown at work moving 25,000 cubic yards of earth for new location



POLYMERIZATION

and What It May Mean to Natural Gasoline Industry

By G. G. BROWN and DONALD L. KATZ
University of Michigan

"Polymerization" has become a common term in the vocabulary of most oil men during the past few years. "Polymerization" plants are multiplying rapidly in the refineries for the purpose of converting gaseous hydrocarbons into marketable motor fuel.

Polymerization is defined as the addition of two or more molecules to give a molecule of higher molecular weight. True polymerization processes are those which build large molecules out of small er molecules, but not all small molecules have the ability to combine. For instance, unsaturated compounds such as propene and butene will combine to give six and eight molecule compounds respectively thus converting gaseous material into products suitable for motor fuel. However, saturated compounds such as ethane, propane, and butane are not known to unite with each other to give polymers. It is necessary to change the saturated hydrocarbons into unsaturated compounds before they will unite.

The gaseous products which are of interest to the natural gasoline industry as feed stocks to polymerization processes are all saturated compounds; namely, butane, propane, and ethane. These compounds may be converted to unsaturated compounds by dehydrogenation or by pyrolysis or cracking and then polymerized to form compounds boiling in the motor fuel range. The use of the term "polymerization" as referring to the conversion of natural gasoline compounds into motor fuel is an enlargement of the true meaning of the word and any such reference must be understood to include cracking or dehydrogenation as a preliminary step.

Because this preliminary step is not required when treating unsaturated hydrocarbons, refinery cracked gases containing large percentages of unsaturated material have received most attention from the polymerization processes. Attention is being given to the cracking or dehydrogenation of the saturated compounds found in natural gas and the polymerization of the cracked products so produced. These steps are conducted separately in some operations and simultaneously in others. The important point, however, is that the polymerization process is proving satisfactory when applied to the saturated compounds found in natural gasoline.

A few years' expansion in the number of polymerization plants will place considerable value on the now mostly waste products from the natural gasoline industry. Any rise in the price of crude oil or decrease in crude oil reserves would surely hasten this expansion. Also as these operations are continued, the costs will probably be reduced, stimulating the further application of polymerization processes to the conversion of more butane, propane, and probably ethane to motor fuel. The purpose of this paper is not to differentiate between the several polymerization operations, but

***N. G. A. A.*—Presented before the annual meeting, Tulsa, Oklahoma, May 19 to 21, 1937**

to discuss the effect of the use of such operations on the demand for natural gasoline and the trends in the natural gasoline industry.

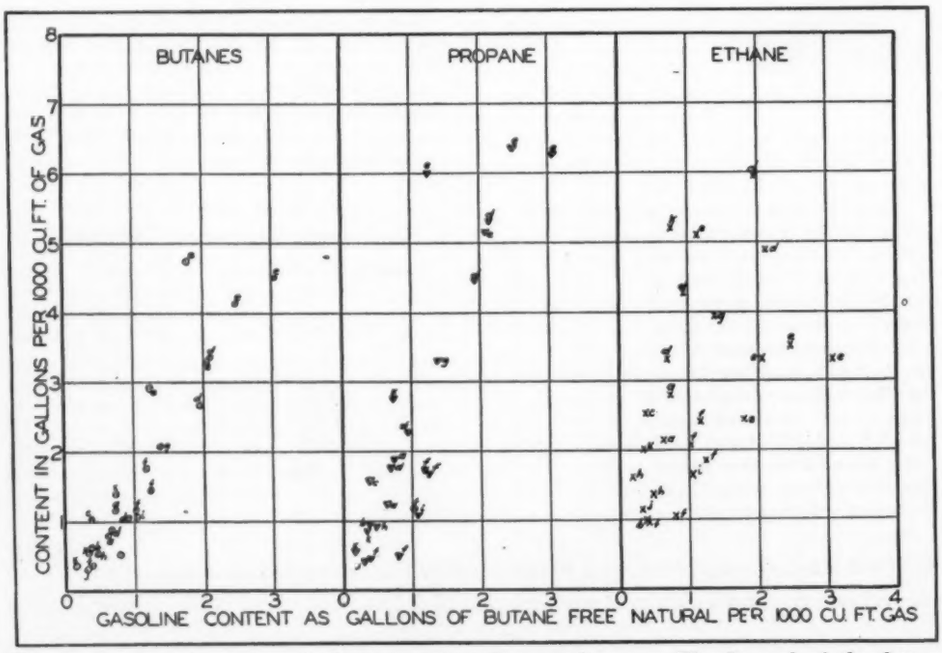


Fig. 1—Butane, propane and ethane content of natural gases. The legend of the letters shown is as follows:

Pool—	Reference	Pool—	Reference
a. Kettleman Hills	21	f. Rodessa	18, 6
b. Dominguez	22	g. South Burbank	19
c. Conroe	23	h. Tepetate	1
d. Oklahoma City	9	i. West Texas	20
e. East Texas	2, 17	j. South Texas	6
		k. Crescent	16

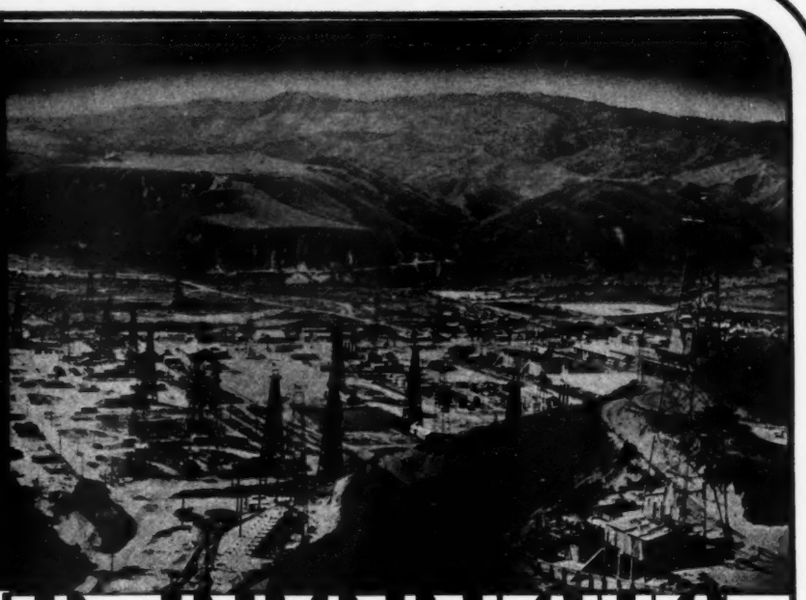
Present Methods of Operation

One of the simplest methods of operating a polymerization process is to bring the material to be treated to an active cracking and polymerization temperature and to maintain the material at this temperature under sufficient pressure to accomplish the desired percentage of conversion for a once-through operation. The desired product is then separated by fractionation and the gases and other low boiling fractions which are recycled through the apparatus in conjunction with fresh feed so that the material being treated is completely converted to polymerized product and gas. Such a scheme of operation is very similar in its conditions of flow to that of a recycling cracking plant, the difference being that the polymer product of lower volatility is a desired finished product instead of the material of greater volatility as is the case of a cracking operation.

Operations conducted in this manner have included the treatment of mixed feed composed of materials of different boiling ranges, such as ethane, propane, butane, or the corresponding olefines; but best results are usually obtained when the charge to such a unit is a substantally pure material such as butane, or represents a mixture of compounds of substantially the same molecular weight. It is reported[3] that such commercial operation[5] yields 45 per cent liquid volume of polymer products, based on C_4, C_3 and C_2 compounds or 57 per cent by weight from a feed composed of 66 per cent liquid volume butanes, 11 per cent butenes, 12 per cent propane, 4 per cent propene, 4.4 per cent ethane, and 2.6 per cent methane; in which 90 weight per cent of the propane and 100 per cent of the butane fractions were recycled, it being impractical to recover the ethane. Similar pilot plant runs gave weight percentages of polymer gasoline varying from 55 to 63 per cent. It is also reported that the polymer product contained as much as 5 to 16 per cent material boiling in the gas-oil range.

The reported properties[3] of the gasoline produced in such an operation are given in Table 1.

Another type of operation which also depends



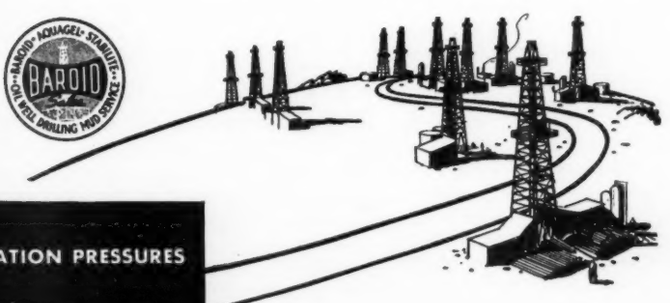
In MANY DEEP PRODUCTION FIELDS

BAROID PRODUCTS

ARE USED TO ASSURE SAFETY, ECONOMY AND SPEED IN DRILLING

The CONTROL obtainable with BAROID, AQUAGEL and STABILITE is one reason for the almost universal use of these BAROID Products in deep production fields as well as those of lesser depths. This CONTROL helps to assure the safety of your investment; to provide less expensive drilling, and to make hole faster.

Stocks carried and Service Engineers available in or near all active oil fields.



BAROID TO CONTROL FORMATION PRESSURES

AQUAGEL TO CONTROL WATER LOSS AND CAKE THICKNESS

STABILITE TO CONTROL VISCOSITY

BAROID PRODUCTS

BAROID-Extra-Heavy Colloidal Drilling Mud. • **AQUAGEL** Trouble-Proof Colloidal Drilling Mud. • **STABILITE**—An Improved Chemical Mud Thinner. • **BAROCO**—An Economical, Salt Water-Resisting Drilling Clay. • **FIBROTEX**—For Preventing or Regaining Lost Circulation in Drilling Wells.

BAROID SALES DEPARTMENT

NATIONAL PIGMENTS & CHEMICAL DIVISION OF
NATIONAL LEAD COMPANY
BAROID SALES OFFICES • LOS ANGELES • TULSA • HOUSTON

upon thermal means for accomplishing the cracking and polymerization consists in operating in two or more separate steps or stages.[4, 20] The first step is that of cracking the butane or other material to be treated, and the major part of the polymerization is conducted in a second step in which the cracked material is held at the pressure and temperature for a sufficiently long time to accomplish the desired conversion or polymerization on the once-through basis. Insufficiently converted material is separated from the polymerized product and recycled through the appropriate part of the plant.

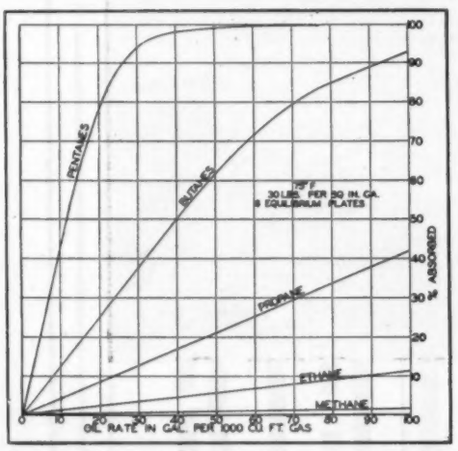


Fig. 2—Effect of oil rate on per cent absorbed

It is reported[4] that a yield corresponding to 2.1 gallons per 1,000 feet of gas of 350° F. endpoint gasoline is obtained by operating in this manner at a relatively high temperature and low pressure from a natural gas containing 70 per cent methane, 12.7 per cent ethane, 10.3 per cent propane and 6.4 per cent butanes plus. This yield corresponds to about 26 per cent by liquid volume, or 47 per cent by weight based on the ethane, propane and butane content of the gas. Characteristics of material similar to this product are also listed in Table 1.

The catalytic process[10, 6] for polymerizing the unsaturated components of the gas, particularly propene and butene, operates at a temperature of about 450° F. and at pressures of about 200 pounds per square inch gauge. This operation has been successfully applied to the polymerization of these unsaturated components in the overhead from stabilizers treating refinery cracked gasoline, in which operations the yield of liquid polymer based on the unsaturated propene and butene content is of the order of 90 per cent, and on the total propane-butane content is similar to the yield obtained by the thermal operations when figured on the same basis. In order to apply the catalytic polymerization process to the treatment of natural gasoline or the saturated compounds recovered from natural gas, it is necessary to convert the saturated paraffin hydrocarbons to unsaturated compounds by a cracking operation which may be conducted either thermally or catalytically. This catalytic polymerization process combined with the thermal cracking of butane is now in commercial operation at Sunray, Tex. The characteristics of the gasoline obtained by the catalytic polymerization of the unsaturated compounds and the overhead from a stabilizer operating on refinery cracked gasoline are given in Table 1.

The development of the thermal and catalytic polymerization processes for the cracking and polymerization of butanes, propanes, and probably ethanes, is taking place rapidly as a result of engineering data on the operation of commercial plants and of fundamental studies in the laboratory.[5, 11, 12] Because of the comparative ease with which these compounds may be isolated in the relatively pure state and the advantages obtained in the polymerization processes by treating substantially pure materials, it seems likely that the demand for butane, propane, and later possibly for ethane, as raw material for cracking and polymerization operations will increase. Probably the major factor in limiting the present success in treating ethane is the difficulty of recovery and handling of such an extremely volatile material in the natural gasoline plant and in the polymerization operation itself. As the catalytic operations for polymerization and for dehydrogenation are developed and perfected, it seems reasonable to expect that these operations conducted at lower temperatures and pressures may ultimately prove more economical and satisfactory than the thermal operations which demand much higher temperatures and in most cases pressures.

In the production of this polymer gasoline, the octane number or antiknock value of the product obtained has attracted most attention. Because of the chemical nature of the compounds formed in these polymerization operations, it is possible to produce polymer gasoline of high octane number (from 75 to 100), but of at least equal interest is the higher blending value of this material when blended back with regular refinery gasoline. The so-called octane blending value is frequently 20 to 25 numbers higher than the octane number of the polymer gasoline itself.

By special treatment, pure hydrocarbons are produced by a combination of polymerization and dehydrogenation. Iso-octane (2-2-4 trimethyl pentane) has been produced commercially for some time by the polymerization and hydrogenation of isobutene obtained from refinery cracked gases. Such materials demand special prices, particularly as special fuel for testing and also for the operation of fighting aviation equipment.

The volatility of the polymer gasoline can be controlled within limits by conditions of operation, but is usually in the same range as refinery gasoline, being a little more volatile at the 50 per cent point. The vapor pressure of the polymer gasoline is generally low, corresponding to about butane-free refinery gasoline. This is to be expected as the butane should be completely removed from the polymer gasoline and returned for further treatment as the butane is the raw material which is supplied to the polymerization plant.

Effect of Polymerization on the Refinery Demands for Natural Gasoline

The high-octane blending value of the polymerized gasoline will cause refinery operators to remove all the butenes and butanes which can be efficiently handled by their polymerization operations from the regular refinery gasoline for conversion into polymer gasoline. This condition creates a tendency for the refiner to produce primarily butane-free gasoline, depending upon the ability of his poly plant to handle the butanes.

If the poly plant can treat only the unsaturated compounds such as butenes, there is thereby created a potential increase in demand for butane to replace the butenes removed for polymerization. In so far as possible the refiner will tend to recover additional butenes and butanes to fulfill this potential increase in demand for butane. In most cases such operations will lead to a low vapor-pressure product which can be greatly improved by the addition of natural gasoline including some butane.

The fact that butane recovered from the refinery and from natural gasoline plants is converted to a polymer gasoline which is substantially butane-free means that for a given run of crude to stills there will be an increased yield of motor fuel. This increased yield may be considered to provide additional demand for natural gasoline and butane for blending with the polymer gasoline at least during the higher vapor pressure season. On the other hand, if the demand for motor fuel is considered to be constant, for fuel of constant volatility the increase of polymer gasoline will result in a lower yield of straightrun, cracked, and vapor recovery gasolines. Because the polymer gasoline is likely to be more volatile than the composite butane-free straightrun, cracked, and vapor recovery product, a slight decrease in demand for natural may result on this score. . . .

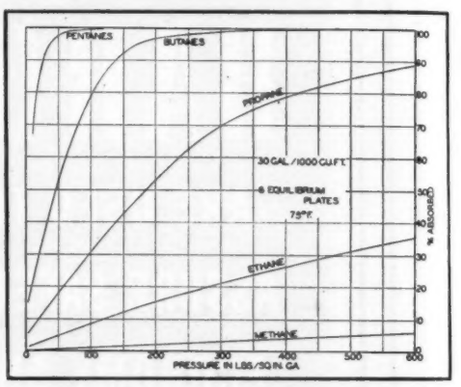


Fig. 3—Effect of pressure on per cent of hydrocarbon absorbed

The application of the polymerization process to refinery operations increases the yield of butane-free gasoline produced by the refinery and decreases the yield of butane available for blending by the refinery. The application of the polymerization process to the treatment of butane, propane or ethane as produced from natural gas affords an independent market for these materials and produces an additional yield of polymer gasoline which is essentially a butane-free motor fuel. Although the effect of the polymerization process on the supply and demand of natural gasoline is complicated, it is clear that the increased flexibility afforded the industry by supplying independent markets for butane and lighter and the reduction in the available supply of refinery butane, will all tend to stabilize the market for natural gasoline and to increase the potential demand for natural gasoline as well as the direct demand for butane, propane and ethane for polymerization.

Reserve for Butane, Propane and Ethane

If the polymerization process is to be widely applied to the components recovered from natural gas, it will be necessary to determine the reserves of available butane, propane, and probably ethane in order to estimate the recovery and to determine

(Continued on Page 162)

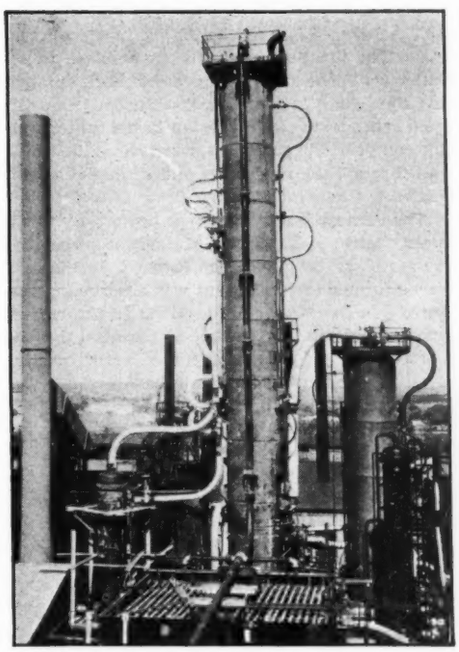
TABLE 1—PROPERTIES OF POLYMER GASOLINE

	Thermal (3) unitary process	Thermal (4) high temp. low press.	Catalytic (5)	Butane (27) free natural
A.P.I.	62 5	20-30	68 1	78 8
Reid vapor pressure	8 9	....	10 5	11 5
Octane No.	77 5	*104	†81	*64 9
Sulfur wt. %	0 02	....	....	....
Octane blending value	80-110	105-125	120	....
Distillation—				
I.B.P.	104	120	102	....
5 per cent	119	158	148	....
10 per cent	127	172	156	112
20 per cent	138	185	178	....
30 per cent	149	190	196	....
40 per cent	162	198	205	....
50 per cent	179	205	214	136
60 per cent	199	213	222	....
70 per cent	220	225	243	....
80 per cent	249	240	270	....
90 per cent	303	270	336	214
95 per cent	375	300	....	242
Endpoint	428	325	418	....
Residue	1.0	1.0	1.5	....
Per cent recovery	97 5	98.	97.	....
Loss	1 5	1.0	1.5	....

*ASTM. †Motor.

Johnson Oil Installs Two-Coil Selective Cracking Unit at Cleveland

By WILLIAM J. LEENHOUTS
Johnson Oil Refining Co.



Main fractionating column and flash chamber in Johnson's Cleveland, Okla., refinery

Johnson Oil Refining Co. has just put into operation a new Dubbs cracking plant and can boast of one of the most up-to-date cracking units in the Mid-Continent field. This investment and improvement is an encouraging sign of the company's faith in the industry. Rapid strides have been made in the last few years in the design of cracking plant equipment and the new unit bears very little resemblance to units of similar type erected 5 or 10 years ago, when design and efficiency is considered.

The problem which has been most annoying on the former type of units has been one of keeping the units on stream for any great length of time. As the company designed its plant for long cycles of operation ranging from 30 to 60 days, a number of different setups for cracking were considered before deciding on their present new unit.

It has been known for some time that all charging stocks cannot be cracked under the same conditions of time and temperatures. Some oils, even in the same process, require relatively low temperature with short time while others may require high temperature with long soaking time. There is, therefore, a preferred design and arrangement for each type of cracking process. Selective cracking units are economically designed with two or more cracking furnaces and a combined secondary system in which the light and heavy fractions of fresh feed and recycled stock are segregated for charging into separate coils.

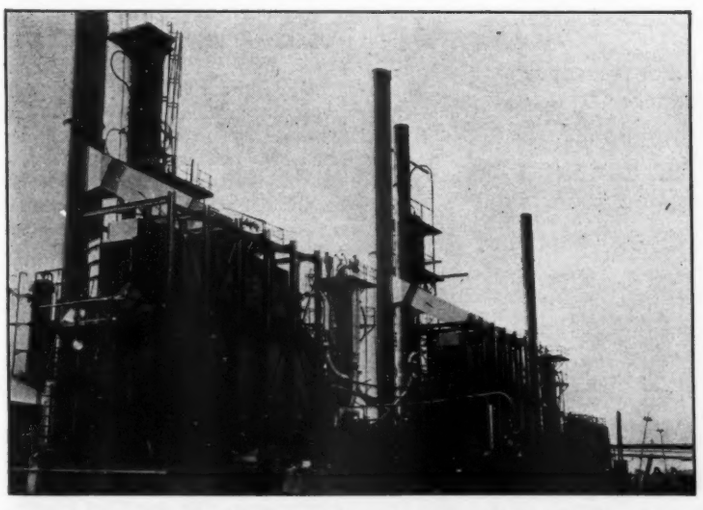
Johnson's unit is a two-coil selective cracking unit with stabilization and absorption equipment, having a capacity of 2,500 bbls. per stream day.

In order to get an idea of the design of the new cracking unit it will be necessary for the reader to follow the flow of the oil through the plant.

Part of the topped crude is used as an absorption medium before entering the cracking plant proper. Topped crude is pumped over the top of the absorption tower, going down the tower countercurrent to the gases, which are coming up. All gases made on the new unit are passed through this absorption column. The dry residue gas leaves the top of the absorption column ready for use as a refinery fuel. The furnaces are heated by the gases made in the process of cracking. The gas-saturated topped crude, together with the remaining topped crude, is then pumped into the main fractionating column.

The main fractionating column is a vessel 7 feet in diameter by 73 feet in height. The tower has a working pressure of 95 pounds and an operating pressure of 75 pounds with a temperature range from 350 to about 800° F. The tower contains 26 trays, the top section being filled with bubble trays and the lower section with side-to-side trays. Several streams are removed from the fractionating column.

At this time we are only interested in following the two charging-stock streams which are taken off from the bubble tower. The topped crude is pumped on the seventeenth tray of the tower and has a flow downward and countercurrent to the hot cracked vapors from the unit. These hot vapors going up the tower segregate and fractionate the recycled stock and the topped crude into two distinct cracking fractions — one a heavy oil fraction of about 18 to 19 gravity, which is taken from the bottom of the fractionating tower; the other fraction is taken off from the reservoir at the twelfth tray of the fractionating tower and is a light oil cracking stock of about 24 to 26 gravity. This charging stock has a boiling range between 400 and 600° F.



Front-side view of the two furnaces used in the 2,500-bbl. refinery

Before describing the fractionating tower any further and the products that it takes off, we will now follow the two types of cracking stock through the hot oil pumps and the furnaces.

The heavy-oil cracking stock is picked up with a 5¾-inch bore by 18-inch stroke horizontal duplex, outside endpacked, double plunger pump, driven by a three-cylinder, four-cycle vertical diesel engine. The capacity of this pump is 256 to 360 gallons per minute at a temperature of 685 to 750° F. The pump is capable of working at a discharge pressure of 700 pounds and has a suction pressure of 70 pounds. The pump has water-cooled glands, plunger, and pedestal and the liquid end is made of a solid forged-steel billet.

The light hot-oil pump is similar in construction to the heavy-oil pump except that it has a 4½-inch bore and an 18-inch stroke. It has a capacity of 138 to 187 gallons per minute at a temperature of 570 to 630° F. It is capable of giving a discharge pressure of 950 pounds with a suction pressure of 70 pounds.

We will now follow the course of the oil from the hot-oil pump to the heavy-oil furnace. The furnace is a center wall, updraft, radiant type furnace, having a fire wall which extends through the full length of the furnace, dividing the interior into two compartments. The side wall and roof are of refractory tile construction and all the tile are suspended and held in place by hangers bolted to the structural steel work of the furnace.

The refractory tile is backed with 2 inches of insulation, an air space and then one-eighth inch steel flashing. The oil through the furnace is in two parallel flows—one in each compartment. The furnace is capable of handling 6,500 bbls. of new charge and recycled stock per stream day. The inlet pressure is about 500 pounds and 685° F. The outlet pressure is about 250 pounds with a temperature of about 935° F.

The charge into the furnace is divided into two equal, parallel streams through each half of the

furnace. Each stream passes downward through the convection section consisting of 52 tubes, 3¼ inches O.D. by 2½ inches I.D., then through the radiant shock tubes of the roof of the furnace, of which there are 12 in number and are 2¾ inches O.D. by 2¼ inches I.D. The charge then passes through the radiant wall tubes which are 36 in number and are 2¾ inches O.D. and 2¼ inches I.D.

The furnace is fired by 20 gas burners which are set in the floor of the furnace close to the center wall. The gases go upward at such an angle that the flames impinge against the projected fire brick set in a staggered fashion in the center wall. The course of the gases is upward along the center wall through the roof tubes and through the convection sections into the breeching of the stack.

The furnace is a radiant type heater. By this is meant that 70 to 75 per cent of the heat is absorbed in the radiant section of the furnace. In the company's former furnaces, heat was absorbed almost entirely in the convection section. In the radiant type furnace, heating must be so arranged that the tubes are out of the path of the hot or burning gases. Flame impingment on tubes will cause overheating of the tubes with resultant coking and loss of tubes.

In the new type of furnace combustion in the radiant section takes place without flame impingment. The direction and velocity of the flue gases is controlled and uneven heating is eliminated. For the best results and long runs from cracking heavy oil the time element under high temperature should be reduced to a minimum and the oil brought quickly and uniformly up to a maximum desired temperature at the outlet of the furnace.

The high velocity of oil through the tubes is accomplished by the hot-oil pump. The heavy hot-oil pump allows a pressure drop through the furnace of more than 250 pounds. This pressure drop causes a very rapid passage of oil through tubes.

Although the design of the light-oil furnace is similar to the heavy-oil furnace, the flow of the oil through the furnace is slightly different. The charge is pumped through the convection section of the heater in two equal, parallel streams. These streams are then combined at the outlet of the convection section and flow in series through the left side or radiant section of the furnace, starting from the bottom upward then across through the radiant roof-section tubes and then down the right side-wall tubes forming the soaking bank of the furnace. Since the left side of the furnace contains soaking bank tubes, it can be fired separately and the temperature independently controlled.

The light-oil furnace is capable of handling 3,500 bbls. of light recycled stock per stream day. The inlet pressure to the furnace is approximately 900 pounds and the oil has a temperature of about 570°. The outlet pressure of the furnace is 600 pounds per square inch and the temperature is about 985 to 995°.

This two-coil, two-furnace hookup allows the operator to bring each type of charging stock to the most desirable temperature and conditions for cracking. If the light- and heavy-oil charging stocks were circulated through a single furnace coil to a temperature of 990 to 995° F. the heavy oil would coke in the tubes, causing a shutdown, or if heated only to 930 to 935° F. the light oil would recycle several times without much cracking. This shows the distinct advantage of selective cracking.

The streams from the light- and heavy-oil furnace,, which run 995 and 935° F., respectively, are combined into common transfers before entering the reaction chambers. The two reaction chambers are both 2½ feet in diameter and 25 feet long. One has a wall thickness of 2½ inches and a working pressure of 350 pounds. The other is 1¼-inch wall thickness and a 260-pound working pressure. The reaction chambers give the cracking stock a longer period of time at a high temperature. The cracked stock goes into the top and out of the bottom of the reaction chamber. After this material leaves the reaction chamber the pressure is dropped to 75 pounds as it enters the flash chamber.

The flash chamber is 7½ feet in diameter by 32½ feet in length, 1 inch in thickness and good for 95 pounds of working pressure at 850° temperature. In the flash chamber there takes place a separation of the cracked vapors and the residual fuel oil. The vaporized fractions pass out of the top of the chamber to the main fractionating column and the heavy residuum flows from the small pot in the base to a 10 by 5 by 12-inch hot-oil pump which, in turn, pumps it through the residuum cooler, and thence to the storage tank.

The fluid level in the flash chamber is held constant by a float control in the bottom of the flash chamber and only a small amount of oil remains in the chamber at one time. The fuel oil from the plant is a residuum of Bunker C specifications. This fuel can be cut back with a fraction taken from the main bubble tower, thus making a lighter grade of fuel oil.

We are now back to the main fractionating tower where we originally started with the topped crude. The topped crude originally was pumped on the seventeenth tray of the fractionating tower and the cracked hot vapors are discharged into the bottom of the fractionating tower. These vapors pass up through the fractionating tower and as they do so are fractionated into various types of distillates, fuels and charging stocks.

Several streams can be taken from the main fractionating tower. First of all, a stream of unstabilized endpoint gasoline is taken off overhead. The temperature in the top of the tower and the endpoint of the gasoline is controlled by means of a reflux pump which pumps cold pressure distillate over the top of the tower, thus controlling the temperature of the vapors leaving. The plant can be operated so as to make only endpoint gasoline, residuum fuel and gas but it is also possible to take off various side cuts as the market may demand.

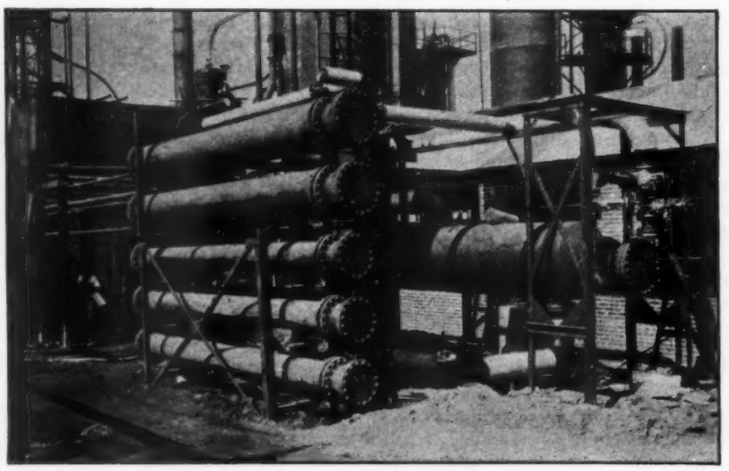
From the seventh tray of the fractionating tower it is possible to take off a side cut of tractor distillate. This material is finished in a side stripper column which is 42 inches in diameter and 22 feet long. This same side stripper column can be used in making Nos. 1 or 2 furnace oil by taking a side cut from the ninth bubble tray of the main fractionating column. It is also possible to take off a fraction from the twelfth or sixteenth bubble tray. This fraction can be used for fuel purposes or for a cut-back to decrease the viscosity of the residuum fuel.

In addition to the fractions mentioned, the tower also fractionates the charging stock to the furnaces into two distinct fractions; one being a heavy, high-boiling charging stock which is taken off from the bottom of the bubble tower, the other being a light, clean distillate charging stock which is taken from the twelfth tray of the bubble tower.

After the unstabilized vapors leave the bubble tower they pass through the conventional type of condenser coils and into a reflux distillate accumulator. From there the unstabilized gasoline passes through the subcooler countercurrent to water at 60° F., and then into the distillate receiver. The unstabilized gasoline is then picked up by a 12 by 5 by 12-inch duplex pump which pumps it into the stabilization system. The stabilization system contains a stabilizer column equipped with two charge-to-bottoms heat exchangers, shell-to-tube reboiler at bottom of tower and shell-to-tube condenser on top, and three shell-to-tube, water-to-gasoline after-coolers. The gasoline after leaving the pump passes through a heat exchanger countercurrent to the stabilized gasoline as it is leaving the plant. After passing through the heat exchanger it is discharged into about the middle of the stabilizing column.

The stabilizing column is 42 inches in diameter and 43 feet in height, containing 26 bubble trays and has three nozzles through which the feed may enter the column. The temperature of the base of the stabilization column is maintained by a shell-to-tube reboiler through which the gasoline passes countercurrent to a fraction of hot oil from the bubble tower. This hot oil maintains a temperature in the reboiler of about 320° F. and of 280° F. in the bottom of the stabilization tower. The temperature in the top of the column is controlled by a water condenser and can be held at a temperature so that gasoline of any desired vapor pressure can be made. The unstabilized gasoline enters the middle of the stabilizer tower, getting warmer and warmer as it goes downward to the bottom, and then to the shell-to-tube reboiler where it reaches a temperature sufficient to drive off all undesirable light hydrocarbons. The stabilized gasoline

(Continued on Page 46)



Reboiler, after-cooler and exchangers to stabilize overhead products

TYPICAL ANALYSIS OF SOME OF THE PRODUCTS MADE ON NEW UNIT

	Gasoline from cracking unit		Oil to light-oil furnace		Charging stock to cracking unit
Gravity	59.4	59.3	24.5	24.4	27.0
Reid vapor pres., lbs.	9.6	9.8	....	....	....
Octane No.	68	68	....	....	....
Initial boiling point, °F.	95	95	400	400	535
Per cent:					
10	132	136	460	455	569
20	163	170	471	469	611
30	197	205	482	480	642
40	225	236	489	487	675
50	253	266	495	496	692
60	279	292	507	507	716
70	305	314	522	520	743
80	333	340	539	536	750
90	368	368	556	557	764
95	386	388	575	572	...
Endpoint	397	396	604	599	784
Recovery, per cent	97.0	96.5	98.0	98.0	94.5

Analysis of residuum fuel: Gravity, 9.5 Be. Flash, 275° F. Fire, 375° F. Furol viscosity at 122-120 sec. Pourpoint, below 25° F. B.s. and w., 0.4 per cent.

Present and Future of Pumping Wells in the East Texas Field

By G. L. NYE and E. B. MILLER, JR.
Tide Water Associated Oil Co.

The pumping of oil from a reservoir is a function of such importance and involves so many problems that much could be written on any phase of the subject. The purpose of this paper is to present in a general way present and probable future methods of pumping oil and the conditions that govern its production.

At the present time there are approximately 23,000 producing wells in the East Texas field; of this number some 3,525 are now artificially produced and 2,429 on which some form of pumping equipment has been installed, but not operated. In other words, 27.2 per cent of the total number of wells in the field have already been equipped for pumping, leaving 72.8 per cent yet to be equipped at a future date. Already there has been installed such a variety of pumping equipment that an operator has an opportunity to inspect almost any type equipment he desires, from the most primitive contraptions to the very latest and most improved designs.

***A.P.I.*—Presented before the East Texas Division of Production, Kilgore, Texas, May 25**

It is assumed in this discussion that future methods of determining well allowables will not be based upon the quantity of oil that can be pumped from each well. In the event the procedure for making potential tests should be made similar to that in the Oklahoma City field, where the allowable is based on the quantity of oil which can be flowed naturally or artificially or pumped from each well, much of the equipment now installed in East Texas would be most inefficient and inadequate.

The Woodbine sand is very permeable and porous and readily yields the fluids contained in the reservoir. There are a few localities where there are tight sand conditions and the inflow of oil or water into the well bore is slow; these are for the most part located along the eastern edge and south part of the field. The sand varies from firm to loose and unconsolidated with a very small amount of cementing material present. The sand varies in size from fine-grained sand to coarse pebbles. Although there has been no serious problem in the field as a whole from wells sanding up, there are certain localities, in which the sand is poorly cemented, that are confronted with this problem. It has been necessary in some instances to clean this sand from the hole with a sand pump.

The East Texas field is a typical water-drive field and derives its reservoir pressure from the hydrostatic head from the west side of the East Texas Basin. The original pressure in the reservoir was 1,620 pounds; at the present time, according to Railroad Commission figures, it is 1,170 pounds, or a drop of 450 pounds in five years. The level at which the fluid in the hole will stand is in direct relationship to the pressure at the sand face. On the east side of the field, where pressure is lowest, the fluid is found to be low, and on the west side, where reservoir pressure is high, the fluid level is correspondingly higher. These conditions must be taken into consideration when selecting pumping equipment. An east side well in which no water is present, will flow naturally with reservoir pressures as low as 800 pounds. There is no definite pressure at which a well will cease to flow, but the majority of them are ready to go on the pump when the bottom-hole pressure drops to between 800 and 850 pounds.

On the west side of the field, where pressures are much higher, from 1,000 to 1,300 pounds, wells cease to flow because of the presence of water in such amounts that it increases the weight of the column of fluid to such an extent that there is not enough pressure to lift it. The majority of wells on the west side cease to flow naturally when the percentage of water reaches 25 to 30 per cent.

George L. Nye, Tide Water Associated Oil Co.

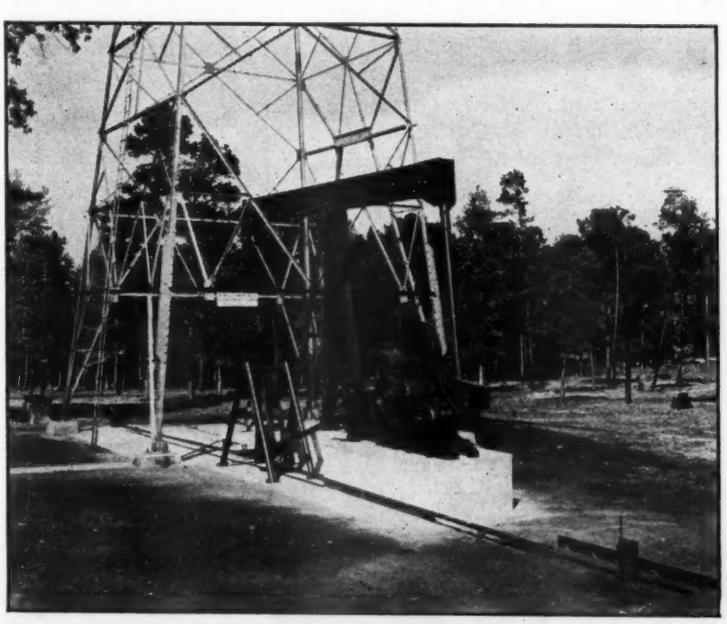


Fig. 1—Electric-driven multiple well hook-up from back-side crank to stroke post, in the East Texas field

Natural Division of Field

The physical characteristics of the field are such that for the purpose of this discussion it will be divided into three parts: the west side, east side and middle or "fairway."

West Side of Field

The west side of the field has a thick sand section and only the top few feet are oil bearing; the fluid levels are high in this area due to the high bottom-hole pressure. As oil is withdrawn from the reservoir the water table rises in proportion. The operator, when installing pumping equipment in or adjacent to this water-producing area, should take into account two factors: (1) Present rate of oil and water production, and (2) how soon will it be necessary to handle large volumes of fluid in order to obtain the oil allowable?

At the present time the principal types of equipment being installed in this area are the individual unit and multiple well hook-up, in which two or more wells are pumped by means of back-side cranks. The majority of individual units are 30 to 40-hp. geared type operated by 35 to 45-hp. engines. A number of companies are, however, installing standard rigs with 40-hp. horizontal gas engines.

Most of the wells are equipped with 2½-inch

WE X-RAY THE "SHOOTING STRING"

You never hear of a Lane-Wells Gun-Perforator being lost in a well or accidentally detonating. That is because the 12,000-foot string of steel cable with its core of insulated conductor wire has been pre-tested in every conceivable manner. From the outset, Lane-Wells engineers have visualized every possible hazard and have devised completely preventive safeguards. When a Lane-Wells Gun-Perforator is lowered into a well it has positive and proven control going in, firing, and in coming out. Every foot of the one-piece electric core within the steel cable is given an inch-by-inch X-Ray examination to insure against thin or uneven insulation, kinks, and other defects. The result is that Lane-Wells Gun-Perforating at any depth is as accurate and as dependably controlled as if the job were being done in full view on the surface. In addition to every mechanical precaution you have the field services of our thoroughly experienced "Shooters."

Note: Devices used and method of operation are fully protected by U. S. Patents and Foreign Patents Pending.

LANE-WELLS PACKERS . . . . Lane-Wells "Multiple Ring" Packers have remained set for as long as four years, under severe temperature conditions, without a single instance where the packing element has vulcanized to the casing. Lane-Wells "Multiple Ring" Packers absolutely seal under any well pressure.

Other Lane-Wells Products and Services include: Liner Hangers • Anchor Formation Packers • Rat-Hole Packers • Well Washers • Strata-Graph and Lo-Kate-It Services (outside of California, under license from Oil Well Water Locating Co.)

Tomorrow's Tools Today

THE LANE-WELLS CO.

Gun Perforator Service

General Offices and Factory: LOS ANGELES, CALIFORNIA

The Lane-Wells Co. of Texas . . Houston and Corpus Christi • The Lane-Wells Co. of Oklahoma . . Oklahoma City and Tulsa • The Lane-Wells Co., New York.

tubing, although some companies have standardized on 2-inch tubing throughout the entire field.

The multiple well hook-up, as we know it today, is a comparatively new method and is becoming increasingly popular. The determining factor as to whether or not it would be profitable to install this type of equipment is: how soon will it be necessary to handle large volumes of water in order to obtain the well's allowable? As it is necessary to operate a jack at a slower rate of speed and with a shorter stroke than on an individual unit, the amount of fluid that can be handled is limited from 250 to 300 bbls. per day. In order to produce this amount it is necessary to operate the machinery near its capacity.

The multiple well hook-up is usually installed on the assumption that the jacks will be able to lift the necessary amount of fluid to obtain the well's allowable oil for a period of at least three or four years. In this length of time the interest on the money saved by equipping two wells with jacks, instead of individual units, will pay for the installation of these jacks, and the depreciation will not be as great as on the larger equipment. Assuming it costs approximately $3,000 to install an individual unit; it would cost $9,000 to equip three wells. These same three wells could be equipped for pumping in a multiple well hook-up for about $5,300, a saving of $3,700. In three years interest on $3,700 at 6 per cent will amount to $666. The jacks could then be replaced with individual units upon which no depreciation had taken place. The cost of installing the jacks would have been paid for by the interest received. For this program to be profitable it is necessary that the interval between the installation and the time when the amount of fluid to be produced exceeds the capacity of the jacks be determined accurately.

Along the extreme west side of the field the tendency will probably be to replace present equipment with individual units as soon as it has reached its capacity. When it becomes necessary to handle large quantities of water, as is the case in other Woodbine fields in the East Texas Basin, larger tubing and plunger-type pumps, or some other pump designed for this purpose, will no doubt replace to a large extent the 2-inch and 2½-inch common working barrel.

The East Side of the Field

The east side of the field is characterized by a thin sand section, low bottom-hole pressure and correspondingly low fluid level, low permeability in some locations, and for the most part an absence of water. It is probable that the equipment in this area will not be called upon to handle large volumes of fluid and that pumping loads will be much less than on the west side of the field. This area is particularly suitable for installation of powers on leases of such a size and shape to be correctly operated. The cost of installing a power is approximately $9,000 to $10,000; equipping wells with jacks $700 to $900 per well, or an over-all cost per well, where 12 or more wells are connected, of $1,700. The majority of powers now installed in the field are geared powers operated by 100 to 130-hp. engines and are located along the east edge, although some operators have felt justified in installing central powers along the west flank.

Where individual well units are suitable, a smaller unit is being used than on the west side. Most of these are 20-hp. geared units operated by 20 or 25-hp. multiple cylinder engines.

Multiple well hook-ups are becoming increasingly popular, especially on leases that are not suitable for the installation of central powers. This type installation is particularly adaptable to six- and seven-well leases and leases of such shape and topography as to prohibit the use of powers.

The majority of wells in this area are equipped with 2-inch tubing and a common working barrel or insert type of pump.

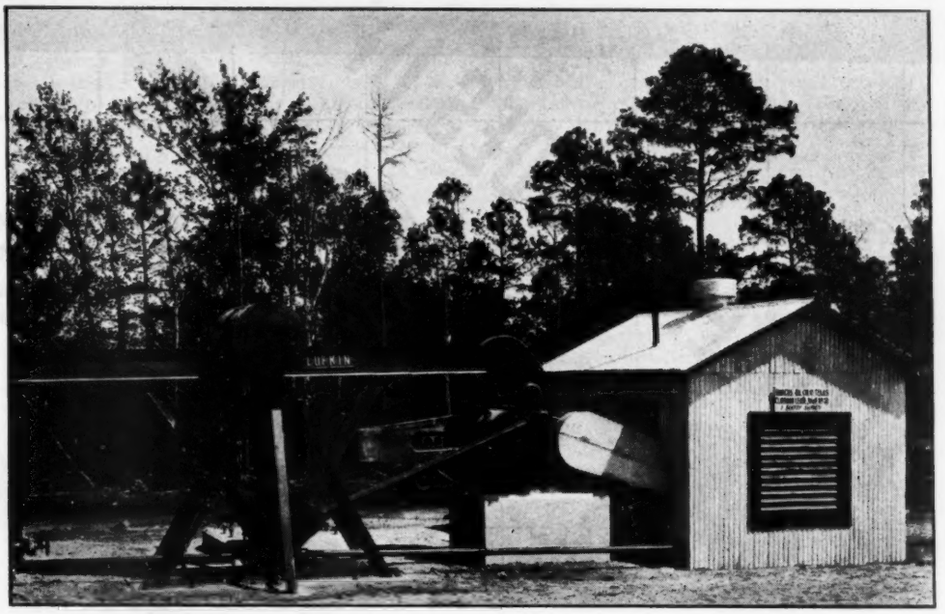


Fig. 2—Counterbalanced stroke-post on multiple well hook-up, East Texas field

The Middle (Fairway) of the Field

The middle of the field or "fairway" will undoubtedly have a long flowing life. It is impossible to draw a line through any portion of the field and state definitely that wells on one side will have west side characteristics and wells on the other side will have east side characteristics. The depth to which the well has been drilled into the oil sand and the success of plug-back work will determine to a large extent into which division individual wells will fall. Any given well will cease to flow from one of two reasons: either the bottom-hole pressure has declined to the point where it cannot lift the column of oil, or the presence of water is in such quantities that the weight of fluid column is equal to or greater than the existing bottom-hole pressure.

With these factors in mind and the uncertainty connected with them, it is doubtful whether it would be good practice to install any type of equipment until a definite classification can be made.

Fig. 3—Geared crank-type power, 150 hp., pulling 17 wells on an East Texas lease

Surface Equipment

On January 1, 1937, there were approximately 1,278 individual pumping units in the East Texas field. These units range in size from 20 to 40 hp. and are powered by all kinds of prime mover. The individual unit has many advantages, some of which are: adaptability to multiple well hook-up, portability, low installation cost, and mechanical efficiency. Gear reduction has become the most popular method of adapting unit to prime mover. These units are for the most part capable of 72-inch stroke and operate efficiently at 24 or 25 strokes per minute. This type unit reduces the size of the house required and eliminates the need of a belt hall.

A number of companies are installing standard rig fronts powered by 40-hp. horizontal two- or four-cycle gas engines. Where belting is required from the prime mover to the countershaft, V-belt drives are becoming more popular. Endless flat belts with the vertical idler from countershaft to bandwheel are most common and are a decided

ELECTRIC POWER

Whether it's for production, pipe lines or refineries, Purchased Electric Power will do the job better, for less money. Compare its advantages when considering power for any of these activities!

ASSURES . . .

Low Cost Installation, operation and maintenance.
Greater efficiency.
Reduces "Shut-downs."
Not affected by bad weather.
Eliminates Rod and Tubing trouble.
Extreme Portability.
Greater Salvage Value.

PROFIT! BY USING ELECTRIC POWER

PETROLEUM ELECTRIC POWER CLUB

improvement over the clamp belt. Straightaway clutches or stub shafts are being used as takeoffs from prime mover, as most operators plan on servicing wells with portable equipment.

The central geared power is being used more generally throughout the field than the bandwheel power. The geared powers are of two types: single and double eccentric, and crank types. The powers vary in size depending upon the number of wells to be handled, but the majority of them are rated at about 100 hp. The stroke furnished by the powers varies from 36 to 42 inches and are designed to operate at from 12 to 18 strokes per minute. The power is driven from the power take-off at the engine by either V-belt or cog-wheel drive. Nearly all makes of powers are now equipped with selfaligning bearing and weather-proof gear unit operating in an oil bath. Prime movers are of multiple cylinder, and horizontal gas engines with some electric motors, but any type prime mover can be adapted to the drive shaft.

Fig. 4—Individual well unit with twin crank on a pumping well, operated by a small multiple-cylinder engine

There are jacks of many makes and types being used on both the east and west side of the field. Most of them are equipped with some straight-lift device and are rated from 10,000 to 15,000 pounds beam-load capacities. Great improvements have been made in recent years in pumping jacks, much of the power loss due to friction having been eliminated.

Prime Movers

It is impossible to discuss all the various types of prime movers being used in the field as they vary from automobile engines to electric motors. The most popular is the multiple cylinder type with horsepower ratings from 20 to 40 on units and multiple well hook-ups, and 100 to 150 hp. on compressor and central power units.

A great many used horizontal gas engines have been shipped into East Texas, so that it is possible to find almost every make. The majority of new engines being installed are 40-hp. two- and four-cycle engines.

Electric motors are not used extensively throughout the field, although they are becoming increasingly popular. This type equipment probably requires less servicing and replacement than any other type. The accessibility of power and the rate are two of the determining factors for this type installation.

Counterbalancing

It is impossible to install a perfectly balanced power, but an attempt should be made to approach this condition as nearly as practical. There are many advantages to be derived from having a power properly balanced, but probably the most important advantage is the reduction of high peak loads. The size engine installed for any pumping well or group of wells should be of sufficient size to properly handle the peak-load requirements. By having the equipment properly balanced, the motion throughout the whole cycle is smoothed out and much of the shock to equipment is eliminated. A careful study for the location of the power in reference to the present well locations and future development should be made. After the installation has been made, it is advisable to make tests to determine the efficiency and determine what corrective measures may be made. As an example of the benefits derived from a study of this kind, a lease in West Texas was equipped with a central power to pump 20 wells. It was equipped with a 50 hp. engine, for the average horsepower requirements under normal conditions were computed to be approximately 40. A study revealed that a peak load of 76 hp. was being developed. By shifting two wells from the day shift to the night shift and putting two from the night shift on the day shift the power was so balanced that a peak load of only 56 hp. was developed, or 20 hp. less than former arrangement. This change was made at no additional cost to the operator and yet it will be a material saving to him in the efficiency and life of his equipment.

In balancing multiple well hook-ups, the wells are first balanced against each other and then the counterbalance weights are so arranged to correct the difference. A recent development has been the counterbalanced stroke posts, which made it possible to locate the additional weight necessary in the position it will be most effective. The stroke post also absorbs much of the torque force which would be exerted on the crankshaft and relieve much of the pressure on the crankshaft bearings.

On individual well installations the counterbalance should be equal to the weight of the rods plus one-half the weight of the column of fluid and should be so located that as the rods are going down the counterbalance will be coming into a top position or to the point of mechanical efficiency from which point on it will help the prime mover handle the load. Counterbalancing has eliminated much of the clutch and bearing trouble previously experienced in these installations. Too much stress cannot be placed upon the importance of properly balancing equipment and the benefits to be derived from it.

In a paper written for the East Texas chapter of the American Petroleum Institute in 1931 by four of the outstanding engineers in the field, much discussion was given to the type of well-servicing equipment best suited for the East Texas field. The governing point in their selection of equipment was road conditions, or accessibility of the well to portable equipment. Since roads in the field have been greatly improved since that time this is not such a vital question.

Swabbing trucks equipped with winches operated from power take-off or by an auxiliary engine mounted on the truck are by far the most common type of servicing equipment. This type equipment has the advantage in that it can easily be moved from place to place and can cover long distances in a comparatively short length of time.

Winches mounted on tractors will be more popular as additional wells go on the pump and its service can be centrally located.

Stationary pulling equipment installations have been limited to isolated wells or wells which require frequent servicing. With the improved power take-off and tractor units, there is only occasional need for stationary pulling equipment.

Accessories to Rod Lines

The common practice has been in the past to eliminate all possible equipment such as swings, hold-ups and hold-downs, or multipliers, from the rod line. Many of the objectionable features have been removed from this equipment by strengthening their construction and improving bearings. Lubrication systems have also been improved in such a way that a comparatively small amount of friction is developed. In the East Texas field, as well as other pumping fields, swings are being used more frequently to change the direction of pull, so as to more properly balance the load on the equipment. The efficiency gained by having equipment properly balanced far exceeds the loss of power due to friction set up by swings. It is good practice to keep as much extra equipment out of a rod line as possible, but with the improved types they are not objectionable if they will more evenly distribute the load requirements throughout the system.

Proper location and alignment are of first importance in installing this equipment. Careful study will very often disclose conditions where a slight sag in the rod line will eliminate the need of a hold-down.

There is at least one back-side crank unit now on the market that is so designed as to eliminate the need of swings. This unit is operated from the crank by means of a pitman, and wells from most any angle may be connected to it. Some of these are now being installed on multiple well hook-ups.

The three-quarters inch medium carbon steel rod in 2½-inch tubing, and the five-eighths inch rod in 2-inch tubing, are the most popular in use in the field at this time. The double pin rod has found particular application. As there has been very little trouble encountered from the corrosive effect of the Woodbine water, only a few companies have used manganese rods, and these are all located on the west side of the field. The majority of rod failures in the field are caused from fatigue,

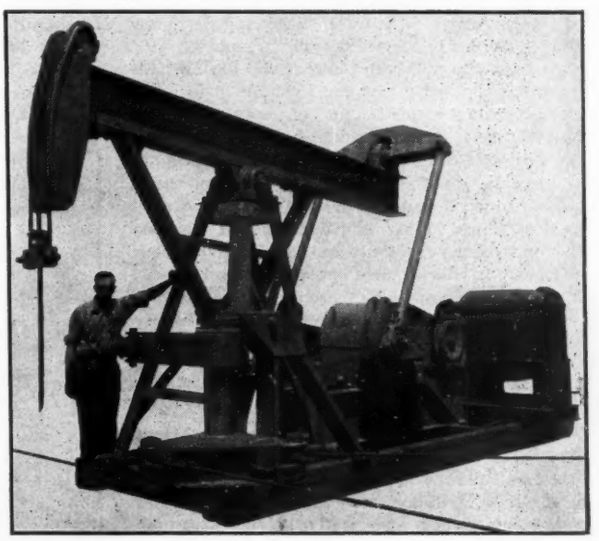


Fig. 5—V-under pull, 4-way attachment, 24-inch stroke, for multiple well hook-up, Henderson district, East Texas field

which is in turn caused by the number of reverses or the reversible stresses set up in the rod by pumping.

Most operators are using seven-eighths inch pull-rods with wooden doll heads as guides. Fatigue is also the cause for most pull-rod failures and is caused by the same forces as in sucker-rods. This effect is many times localized and intensified by clamps fitting improperly on the buttons of the rod. The resulting action is similar to bending a piece of wire backwards and forwards until it breaks.

The insert or rod pump is being used by a majority of the operators on the east side of the field. This pump permits the servicing of both the barrel and plunger without disturbing the tubing. There are two kinds of insert pumps, the traveling-tube type and the stationary or plunger-insert type. Neither type is designed for a capacity pump. In 2-inch tubing a 1½-inch bore is the largest size that can be used. A pump of this size operating at eighteen 36-inch strokes per minute and rated at 80 per cent efficiency will lift approximately 130 bbls. of fluid in 24 hours. A 2-inch bore pump is the largest size that can be used in 2½-inch tubing, and operating under the same conditions will lift approximately 225 bbls. of fluid in 24 hours.

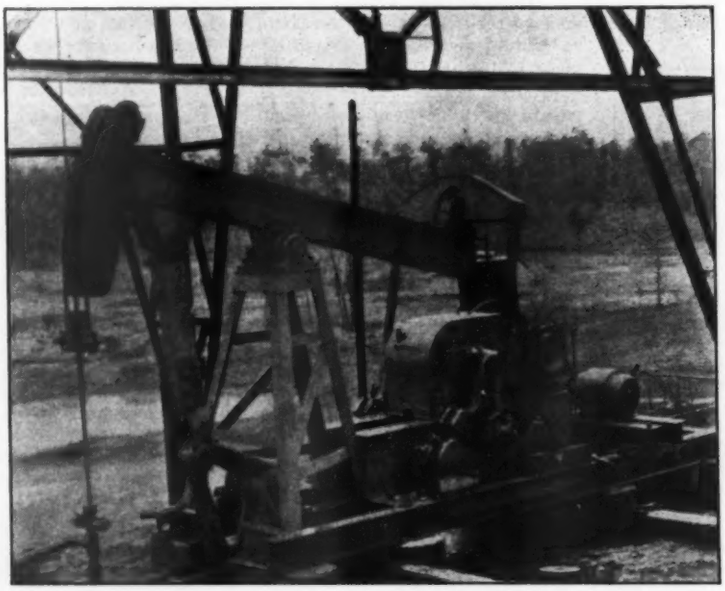


Fig. 6—Bell crank-attachment used with two- or three-well hook-up in the Gladewater district

The tubing or common working-barrel pump is being used principally on the west side of the field. In order to service this pump completely, it is necessary to pull both the rods and tubing. This pump consists of a plunger working inside of a working barrel which is a part of the tubing string. Many of the insert pumps which were installed on the west side have reached their capacity and are being replaced with this type pump. One and three-quarters inch bore is the largest size that can be used in 2-inch tubing, and operating at eighteen 36-inch strokes per minute and rated at 80 per cent efficiency it will produce approximately 184 bbls. of fluid per day, or an increase of 41 per cent over the insert type. In 2½-inch tubing a 2¼-inch bore is the largest that can be used and under the same conditions will lift approximately 304 bbls. per day, or an increase of 35 per cent over the insert-type pump.

When it becomes necessary to produce larger volumes of water than the capacities of the above-mentioned pumps the operator can install larger tubing which will accommodate larger pumps, use casing pumps, or electrically driven hydraulic pumps. The casing pump is not designed especially for large volumes of fluid, but rather to do away with the necessity of a tubing string. It is so constructed that any type or size pump can be used as long as it does not exceed the size that can be accommodated by the casing. The pump is run on rod string and sealed against the casing by means of a packer, thus using the casing in place of a tubing string.

In summarizing the present tendencies in the field it may be said that along the west side, individual units and multiple well hook-ups of from 35 to 40-hp. ratings are the most popular equipment, and that along the east side multiple well hook-ups and powers are preferable.

The future tendencies will necessarily vary with the new and improved type of equipment that will no doubt come onto the market. Long-stroke pumping will probably have an important place in future production methods. New types of long-stroke units are being built that permit greater rod travel, thus reducing the number of reversals and also more output per inch of polish-rod travel because the proportion of stroke lost is reduced.

The history of other Woodbine fields and the conditions on the extreme west side of the field, at the present time, forewarns us of the most vital problem we will have to contend with: namely, the production of large quantities of water in order to obtain the wells' allowable.

It is difficult to ascertain the amount of trouble that will be encountered from abrasive action of sand, but it is almost certain that considerable trouble will be had, especially on wells where a thick sand section has been exposed and large volumes of fluid are to be withdrawn.

Paraffin is and will continue to be a problem in producing oil especially where flow rates and pumping speeds are low. Proper methods and precautions should be taken to prevent the separation of paraffin and retard its accumulation.

It must be remembered that much of what has been said about the future conditions and problems of the East Texas field, and the sufficiency of pumping equipment which has been installed and is being installed, depends upon the regulations promulgated by the Railroad Commission.

INSTALLS CRACKING UNIT

(Continued from Page 38)

then passes out through two heat exchangers countercurrent to the incoming gasoline and then through three sections of a water-to-gasoline aftercooler, the gasoline flowing countercurrent to 60° water coming into the plant. From there the stabilized gasoline goes to the storage tank. After passing through the stabilization system the gasoline is free of ethane and propane, and the butane per cent is controlled according to the vapor pressure of the gasoline desired.

The gas vapors leaving the top of the stabilizing tower may still contain desirable gasoline fractions and they in turn are passed back through the absorption column where the desirable gasoline constituents are picked up. The stabilization system is capable of processing 65,000 gallons of gasoline.

Gasoline of any desired vapor pressure and distillation range can be made. Endpoint can also be varied to meet seasonal demands. The yield of gasoline can be varied between 50 per cent and 60 per cent, according to the distillation range and octane desired. In making the usual 400 endpoint gasoline of 68-70 octane, yields of at least 55 per cent can be obtained.

The new unit has all of the latest control instruments. Flow controllers, liquid-level controllers, pressure controllers, pressure recording, temperature indicating and recording instruments are used on the unit and are centrally located on the instrument board in the control house. This instrumentation allows a close correlation of the various parts of the unit and tends toward longer runs, smoothness of operation and better products.

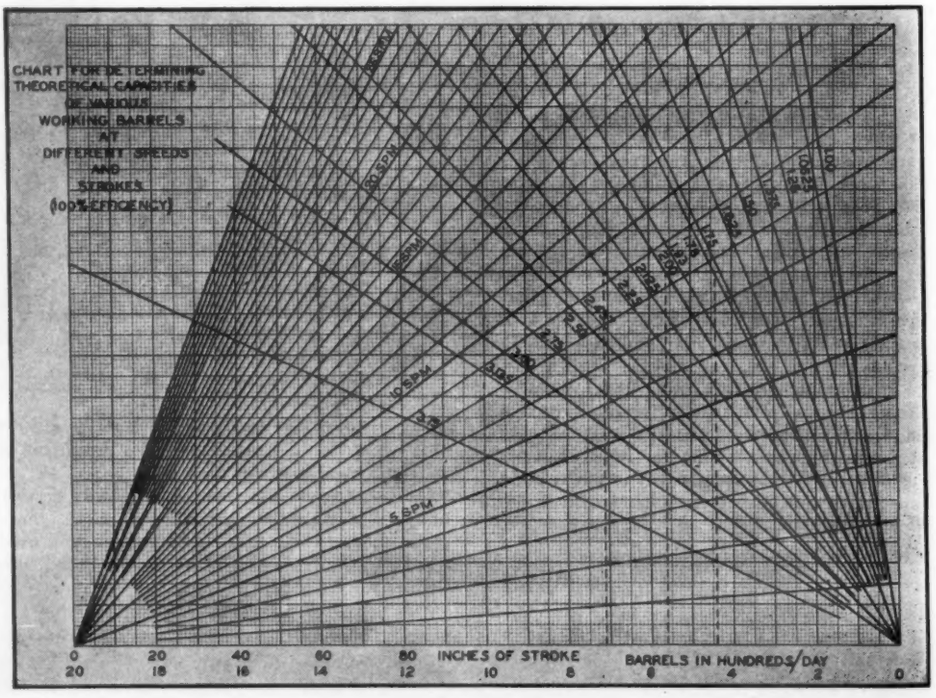


CHART FOR DETERMINING THEORETICAL CAPACITIES OF VARIOUS WORKING BARRELS AT DIFFERENT SPEEDS AND STROKES (100% EFFICIENCY)
5 SPM
10 SPM
15 SPM
0 20 40 60 80 INCHES OF STROKE
20 18 16 14 12 10 8 6 4 2 0
BARRELS IN HUNDREDS/DAY

General Conditions in the East Texas Field

By W. S. MORRIS
Field Chairman, East Texas Engineering Association

The East Texas oil field occupies a unique position in the oil industry in that it is the largest developed oil field in the world from the standpoint of the number of acres in the field, the number of producing wells, the potential of the field, the amount of oil produced to date, and the known oil reserves. The East Texas field as of January 1, 1937, contained approximately 137,800 productive acres on which had been drilled 22,332 wells; these wells had a total one-hour open flow potential of 13,360,482 bbls. and had produced, up to the same time, a total of 961,495,135 bbls. of oil according to reports of the U. S. Bureau of Mines. The remaining oil yet to be produced from the field is estimated to be about 2,750,000,000 bbls.

Figure 1 is a map showing the comparative size of the East Texas oil field with other major oil fields in the United States; all of the fields on this figure are drawn to scale. It may be seen from Figure 1 that the East Texas field, approximately 42 miles long and 4 to 8 miles wide, containing approximately 211 square miles, includes such a vast area that the Hobbs field in New Mexico, the Semi-

W. S. Morris, secretary-treasurer of the East Texas A.P.I. chapter

nole pool and Oklahoma City pool in Oklahoma, the Kettleman Hills field in California and the Yates and Hendrix pools in Texas, can be contained within its boundaries.

The field was discovered on September 8, 1930, by the C. M. Joiner-Daisy Bradford No. 3 (now operated by Hunt Production Co.) in the Ximines Survey of Rusk County, approximately 7 miles north of the city of Henderson near the eastern limit of the field. The first extension was the Deep Rock Oil Co. No. 1 Ashby (now operated by Magnolia Petroleum Co.), also in the Ximines Survey, 1 mile west of the discovery well. The discovery well produced approximately 300 bbls. per day initially while the second well farther west in the field, had an initial production of approximately 3,000 bbls. per day. Another extension was completed on December 28, 1930, with an initial production of 10,000 bbls. per day by E. W. Bateman in the No. 1 L. D. Crim (now operated by Humble Oil & Refining Co.) in the Sevier Survey in the Kilgore section of the

A.P.I.—Presented before the East Texas Division of Production, Kilgore, Texas, May 25

field. On January 26, 1931, the No. 1 Lathrop drilled by Moncrief and others (now operated by Stanolind Oil & Gas Co.) in the William Robinson Survey was completed for approximately 12,000 bbls. per day. This well is located in the Longview section of the field, in Gregg County, about 15 miles due north of Bateman No. 1 L. D. Crim.

It was at first thought that each of the extension wells was a pool within itself but rapid subsequent drilling soon displaced this theory with the fact that all the wells were producing from the Woodbine sand in one connected field.

By the end of the year, 1931, there had been completed 3,612 producing wells on what was then estimated to be approximately 92,000 productive acres, which was a well density of 25.47 acres per well. Table 1 shows the development of the East Texas field from January 1, 1931, up to and including January 1, 1937.

TABLE 1—DEVELOPMENT—EAST TEXAS FIELD

Date—	No. wells	Estimated prod. acres	Avg. well density, acres per well
Jan. 1, 1931	30	.....	.....
Jan. 1, 1932	3,612	92,000	25 47
Jan. 1, 1933	9,372	105,000	11 20
Jan. 1, 1934	11,891	116,000	9 76
Jan. 1, 1935	15,507	124,000	8 00
Jan. 1, 1936	*19,552	132,700	6.79
Jan. 1, 1937	†22,332	137,800	6.17

*January 1, 1936 figures include 304 abandoned wells.
†January 1, 1937 figures include 322 abandoned wells.

From this table it can be observed that the well density has steadily decreased to 6.17 acres per well, notwithstanding the original 20-acre well spacing plan of the Railroad Commission subsequently modified to a 10-acre spacing. In certain parts of the field, particularly in townsites, the number of acres per well is very much smaller than indicated by the table. It has been estimated that of the 22,000 wells in the East Texas field that 16,000 (72.7

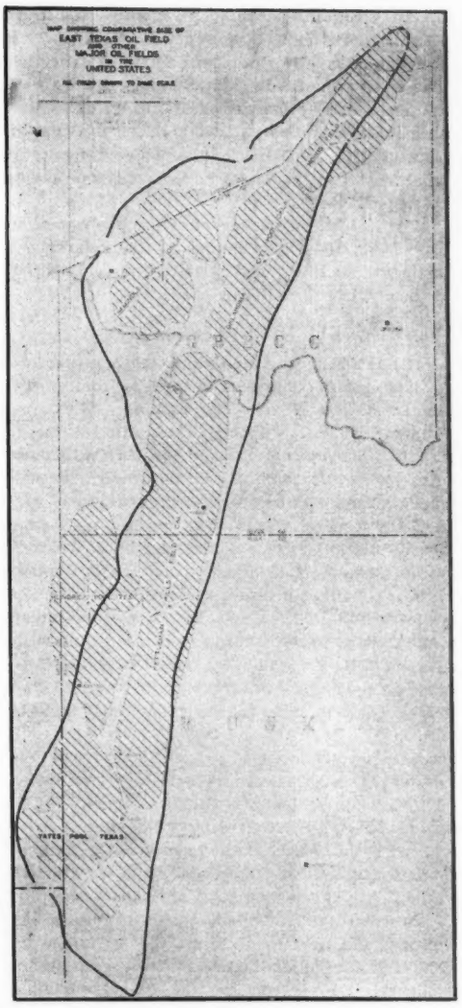


Fig. 1 — Map showing comparative size of the East Texas oil field and other major oil fields in the United States. (All fields drawn to same scale)

per cent) were exceptions to the 10-acre spacing plan promulgated by the Railroad Commission.

Geology

The East Texas field is producing oil from the Woodbine sand found at an average depth of 3,650 feet in the field. The top of the Woodbine sand is found generally at 3,540 feet on the east side of the field and 3,850 feet on the west side. The structure is a monocline type as shown by the generalized west-east cross-section in Figure 2.[1] The Woodbine sand structure is a part of the East Texas geosyncline and is a continuous sand body from the outcrop west of Dallas to the East Texas field where it pinches out against the west flank of the Sabine uplift. The formation, in general, is a broad wedge of sand and sandy clay, which is thickest at the outcrop, thins southeastward and extends beneath the surface 120 miles east and west and 150 miles north and south over an area of at least 18,000 square miles.[2] The portion of the Woodbine sand from which oil is produced in the East Texas field consists of the truncated section as shown in Figure 2.[1, 3] The sand is effectively sealed and completely covered by the Austin chalk which rests

unconformably on top of it. The oil-bearing part of the Woodbine sand lies between the depth of 3,050 feet below sea level on the east edge of the field, where it pinches out, and 3,320 feet below sea level; this depth being the estimated original water level in the field. The west dip of the top of the Woodbine sand is very gentle; the dip at Kilgore being about 50 feet per mile and about 25 feet per mile in the northern section of the field. The area of the field originally underlain by water is approximately the west half of the field with an area of approximately 62,400 acres. There are portions of the field east of the water contact line where wells are, at this time, reported as producing bottom-hole salt water.

For a detailed discussion of the geology of the East Texas field, it is suggested that reference be made to the literature cited in the bibliography at the end of this article.[2, 3, 4, 5, 13]

Well Spacing

It has been estimated that on account of the favorable sand conditions in the Woodbine formation in the East Texas field that one well to every 20 acres, properly spaced and with production scientifically allocated, would result in a recovery of approximately as much oil as would take place under 10-acre, 5-acre, 2-acre or even 1-acre spacing.[6] On the basis of 137,800 acres in the field and 20-acre spacing, it would indicate that 6,890 wells would adequately drain the pool. As of January 1, 1937, Table 1 indicates that there had been 22,332 wells drilled in the field, which is 15,442 more wells than required to drain the reservoir. If the average cost per well were $10,000 the 15,442 excess wells represent an excess investment of $154,420,000. Others have placed excess cost at $162,000,000.[11, 13] Even on the basis of one well to 10 acres, the present spacing rule of the Railroad Commission, the 22,332 wells still represent an excess of 8,552 wells, which, at $10,000 each, represent an excess cost of $85,520,000 to the industry.

During the year 1936, the records of the Railroad Commission indicate that 2,475 wells were drilled in the field. This is a monthly average of 206 wells. Of these, 685 were drilled outside of the proven limits of the field as of January 1, 1936. During 1936 it has been estimated that 5,100 additional productive acres were added to the field, which, on the basis of one well to 20 acres would have required 255 wells, indicating an excess in 1936 of 430 wells. It is estimated that during 1937 there will be drilled 1,800 wells in the East Texas field, the majority of which will be in excess of the number required to adequately drain the pool.

The Woodbine sand as mentioned herein is a continuous sand body from the outcrop to the East Texas field. The sand is porous and holds water throughout its extent, and it serves all the structures within its province more or less alike.[2] The porosity of the sand has been found, by a number of investigators, to be an average of 25 per cent. The permeability is very high and has been reported to be on the average between one or two darcies. The oil produced from the Woodbine sand is about 40° A.P.I. gravity (0.825 specific gravity) of greenish black color and intermediary base; the gasoline content is 36 per cent with an octane value of 57, which percentage may be increased by cracking up to as high as 65 per cent gasoline.

The oil in the reservoir is undersaturated with gas at the pressure originally in the reservoir; in fact it has been determined that there is no free gas in the reservoir, except in the extreme south end of the field. The gas starts coming out of solution at a pressure of 755 pounds per square inch absolute.[7] It has been found that there are 365 cubic feet of gas in solution per barrel of oil at a reservoir pressure of 755 pounds and a temperature of 146° F., when expanded to atmospheric pressure and a temperature of

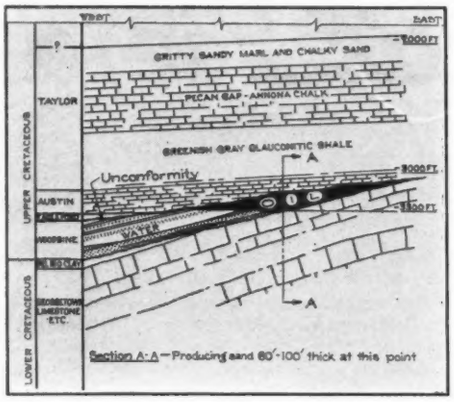


Fig. 2 — Generalized west-east cross-section of the East Texas field

90° F. The shrinkage in the oil when the gas is released and the temperature lowered amounts to 20 per cent. This means that a barrel of oil in the reservoir measures 0.80 bbl. in the lease tanks.

The temperature in the reservoir has been found to be 146° F.[1, 7, 8] This temperature in the reservoir checks closely with some earlier observations and calculations in Northeast Texas.[3] The average reciprocal gradient for East Texas was found to be about 1° F. increase per 50 feet of depth. Applying this factor to the temperature of 71.76° F. found at 100 feet in the Amerada-Wade No. 1 in Upshur County, the calculated temperature at the depth of 3,843 feet where water was found, would be 146.6° F. The reservoir temperature in the East Texas field has been generally accepted as being between 140 and 150° F.[9]

The thickness of the oil-bearing portion of the Woodbine sand varies in the East Texas field from zero on the east side to more than 100 feet in the middle, to zero on the west side of the field. Reistle[1] estimated the average thickness to be 47 feet, of which 35 feet were considered of sufficient porosity and permeability to yield oil.

Based on 137,800 productive acres and 35 feet of 100 per cent saturated sand, there would be 4,823,000 acre-feet of sand; with a porosity of 25 per cent this reservoir would hold 9,354,208,500 bbls. of fluids. If these fluids were all oil and dissolved gas, the total amount of oil, measured in lease tanks, would be 20 per cent less than this total, or 7,483,366,800 bbls. If it is further assumed that the recovery will be 50 per cent of the oil in place then the recoverable reserve would be 3,741,683,400 bbls. Of this amount, there has been produced up to March 1, 1937, a total of 988,180,135 bbls. (U.S.B.M. figures), leaving a balance of 2,753,503,265 bbls. yet to be produced. The methods to be used in obtaining the oil in the reservoir is the subject of this discussion.

Oil Production

Figure 3 is a graph which shows the average daily oil production, by months, from the beginning of the field, up to and including February, 1937. The cumulative production, the number of wells, and the reservoir pressures for the corresponding period are also shown. The production figures were taken from U. S. Bureau of Mines reports and the pressures and number of wells from the engineering department of the Railroad Commission at Kilgore, Tex.

Table 2 shows the classification of wells in the East Texas field on the basis of potential. With the allowable percentage fixed at 2.32 per cent of the hourly potential, wells in the field with a potential of less than 860 bbls. per hour would be in the marginal well classification and receive up to an allowable of 20 bbls. per well per day. The table indicates that there are 16,787 such wells representing 75.23 per cent of the total number of wells in the pool. These marginal wells represent a potential of 8,470,549 bbls. which is 62.20 per cent of the total field. The average potential of all of the marginal wells is shown to be 505 bbls. per hour.

The largest potential wells in the field are between 1,100 and 1,150 bbls. per hour. There are five such wells in the field with an average potential per well of 1,109 bbls. It may, therefore, be seen that the best wells in the field secure an allowable of approximately 6 bbls. per day over and above the marginal well allowable.

The table indicates that there are 5,527 potential wells in the field, which represent 24.77 per cent of the total number of wells. The potential wells have a total potential of 5,147,683 bbls. or 37.80 per cent of the total of the field.

The reservoir pressure in the East Texas field was originally believed to be 1,620 pounds.[1, 9, 10, 11, 12] The decline in the reservoir pressure compared with the oil production is shown in Table 3, which indicates a total decline of 450 pounds per square inch, or 0.455 pound per 1,000,000 bbls. of oil produced to March 1, 1937.

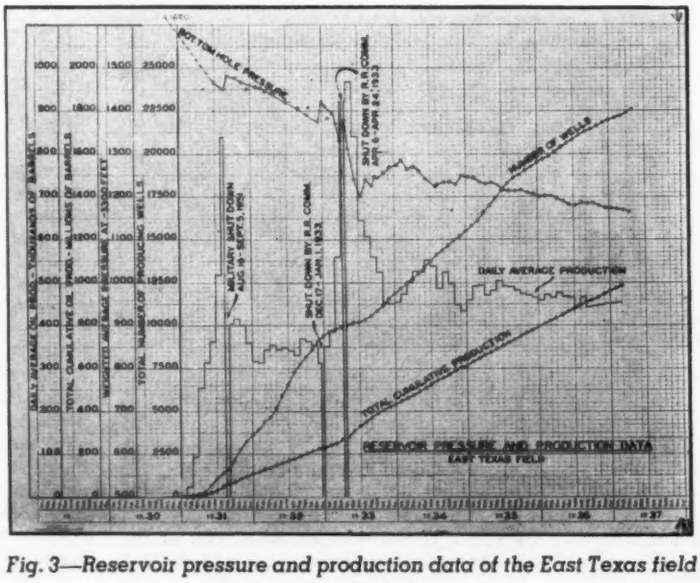

BOTTOM HOLE PRESSURE
SHUT DOWN BY R.R. COMM. APR. 6 - APR 24, 1933
MILITARY SHUT DOWN AUG 19 - SEPT. 5, 1934
SHUT DOWN BY R.R. COMM. DEC. 17 - JAN. 1, 1933
NUMBER OF WELLS
DAILY AVERAGE PRODUCTION
TOTAL CUMULATIVE PRODUCTION
RESERVOIR PRESSURE AND PRODUCTION DATA EAST TEXAS FIELD
DAILY AVERAGE OIL PROD. - THOUSANDS OF BARRELS
TOTAL CUMULATIVE OIL PROD. - MILLIONS OF BARRELS
WEIGHTED AVERAGE PRESSURE AT -3300 FEET
TOTAL NUMBER OF PRODUCING WELLS
1930
1931
1932
1933
1934
1935
1936
1937

Fig. 3—Reservoir pressure and production data of the East Texas field

The weighted average pressure in the reservoir at 3,300 feet below sea level as of March 12, 1937, was 1,161.44 pounds per square inch as shown in Figure 4 (data from Railroad Commission). From this map it will be seen that the pressures on the west side of the field are much higher than on the east side and that the pressures are rather uniform north and south throughout the field. The pressure gradient west to east in the field increases from the north to the south.

For example, on the west-east section No. 4, north of Gladewater, the pressure varies 122 pounds across the field from 1,251 pounds (key well No. 12) to 1,129 pounds (key well No. 17. On section 9, just south of Kilgore, the gradient increases to 171

pounds across the field from 1,230 pounds (key well No. 40) to 1,059 pounds (key well No. 44). The gradient further increases as we go south; section 15, north of Joinerville, shows a drop of 374 pounds (key well No. 68) to 872 pounds (key well No. 75).

For a detailed discussion of the effect of different production rates on the pressure distribution in East Texas, the reader is referred to the literature cited in the bibliography.[12]

The reservoir pressure of the East Texas field is affected materially by the rate of production from the reservoir. Figure 3 shows that the reservoir pressure has declined irregularly; the curve indicates clearly that the decline in pressure has been more rapid at the higher rates of withdrawal. Conversely, the pressure has increased in the field in general, when the rate of production has been reduced. Thus it may be observed that in April, May and June of 1933 when production was in excess of 900,000 bbls. per day, the pressure dropped rapidly (from 1,370 pounds on March 10, 1933, to 1,220 pounds on July 12, 1933), and was checked only when the production rate was considerably lowered. Other changes in the reservoir pressure with different rates of production may be observed from Figure 3 and found in the literature.[1, 10, 11, 12]

TABLE 2—CLASSIFICATION OF WELLS IN EAST TEXAS FIELD BY POTENTIAL

Potential range	No. of wells	Pct. of field	Total potential	Pct. of field	Average pot. per well
0-100	1,053	4 72	66,870	0 49	64
100-200	1,644	7 37	260,846	1 91	159
200-300	1,868	8 37	480,951	3 53	257
300-400	1,665	7 46	649,600	4 77	390
400-500	1,943	8 71	881,043	6 47	453
500-600	1,727	7 74	963,440	7 08	558
600-700	2,237	10 02	1,471,893	10 81	658
700-800	2,327	10 43	1,770,520	13 00	761
800-860	2,323	10 41	1,925,386	14 14	829
Ttl. marginal wells	16,787	75 23	8,470,549	62 20	505
860-900	1,595	7 15	1,411,738	10 37	885
900-950	2,154	9 65	1,992,985	14 63	925
950-1,000	1,592	7 14	1,550,474	11 38	974
1,000-1,050	132	0 59	134,467	0 99	1,019
1,050-1,100	49	0 22	52,475	0 39	1,071
1,100-1,150	5	0 02	5,544	0 04	1,109
Ttl. pot. wells	5,527	24 77	5,147,683	37 80	931
Ttl. field	22,314	100 00	13,618,232	100 00	610

The fact that the reservoir pressure did not continue to decline as more oil was produced, as would be consistent with the expansibility of the oil left in the reservoir undersaturated with gas, indicated that some extraneous force was acting on the reservoir. This force has been investigated and found to be the encroachment of water from the west. The mechanism of the movement of the water has been reported by Schilthuis and Hurst.[10] Briefly, the water does not move from the outcrop of the Woodbine sand into the East Texas field, but rather gradually expands into the field from the surrounding area as oil is withdrawn from the reservoir and pressure within it declines below the pressure in the water saturated portion of the Woodbine sand. The Woodbine sand has been estimated to contain roughly 4,000,000,000,000 bbls. of water, and if the pressure on such an enormous quantity of water were lowered only 50 pounds per square inch, it would expand and supply enough excess water to fill the space left by all the oil produced from the East Texas field to date (October, 1934). Data on the field indicate clearly that water drive on water encroachment is by far the most important agency in maintaining the reservoir pressure or in producing the oil. The effect of the decline in pressure in the East Texas field has been calculated to extend at least 10 miles out in the Woodbine sand.[10]

There is a maximum rate of water encroachment into the field, fixed by the frictional resistance of the sand. If the oil production rate in the field is kept below this maximum rate of water intrusion, the pressures in the field will be sustained, but if the oil production rate is increased

TABLE 3—DECREASE IN RESERVOIR PRESSURES WITH OIL PRODUCTION—EAST TEXAS FIELD

Year—	Oil produced U.S.B.M.	Drop in reservoir pressure: Pounds	Drop in reservoir pressure: Pounds per million bbls.
1930	27,135	...	.....
1931	109,561,000	160	1 46
1932	121,449,000	40	0 329
1933	204,954,000	150	0 732
1934	181,540,000	24	0 132
1935	175,918,000	40	0 227
1936	168,046,000	30	0 179
1937*	26,685,000	6	0 225
Total	988,180,135	450	0 455

*1937, January and February only.

above the critical point, the water pressure head will begin to log with the consequent rapid decline in reservoir pressure within the field. Should the

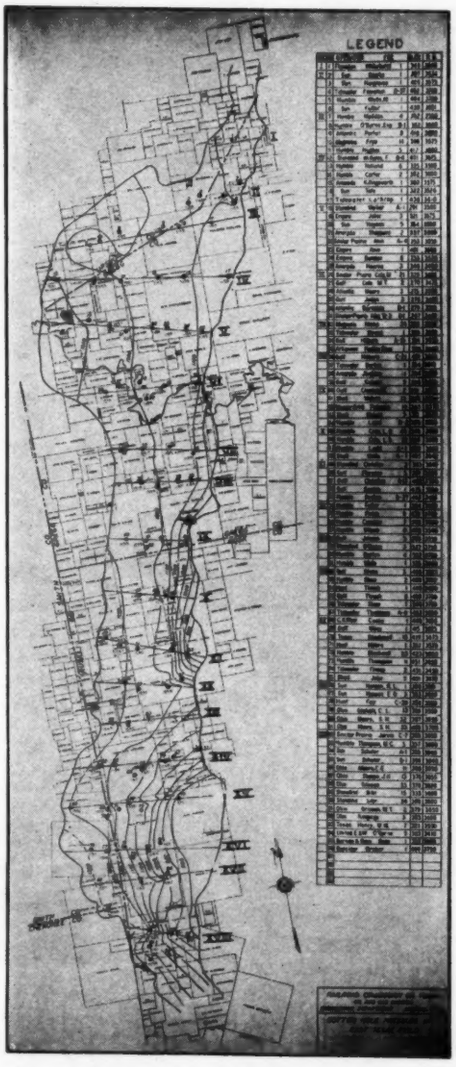


Fig. 4—Bottom-hole pressure map of the East Texas field

drop in pressure reach the point at which gas is liberated from the oil, 740 pounds per square inch gauge,[7] the reservoir would lose much of the valuable lifting energy contained in the gas, and the oil left in the sand would be more viscous and consequently more difficult to flush from the sand body.

The proper production for the field has been suggested at 450,000 bbls. per day.[10, 12] This allowable figure has been exceeded since the latter part of January, 1937, not including the water production which is estimated to be approximately 50,000 bbls. per day. The performance of the reservoir under this rate of fluid withdrawal is being closely observed.

As of the first of the year 1937, there were 27.2 per cent of the wells in the field equipped for some form of artificial lift. Many wells are equipped with pumping units in anticipation of the day when natural flow will cease. During the middle of 1933 when the pressure decline was so rapid, many operators rushed pumping equipment into the field which has not as yet been used. Table 4 is a summary of wells equipped for artificial lift, and shows that 40.8 per cent of wells equipped for pumping are still flowing.

TABLE 4—SUMMARY WELLS EQUIPPED FOR ARTIFICIAL LIFT

Equipment—	No. flowing wells	No. pumping wells	Total number wells	Per cent	Percentage installed and in operation: Jan. 1, 1936	Jan. 1, 1937
Standard rigs	688	582	1,270	21 3	37 5	45 8
Pumping units	472	806	1,278	21 5	45 3	63 1
Backside cranks	288	756	1,044	17.5	55 2	72 4
Wells connected to central powers	964	1,006	1,970	33 0	35 6	51 1
Gas lift	17	293	310	5 3	94.4	94 5
Equipment unknown	0	82	82	1.4	....	11.5
Total field	2,429	3,525	5,954	100 0	44.4	59.2

The author is indebted to the engineering department of the Railroad Commission at Kilgore, Tex., for much of the data on pressures in the reservoir and other statistics; also to the officers of the East Texas Engineering Association for permission to publish this paper. The statements and opinions expressed herein are those of the author personally and should not be construed in any respect as the opinion of the East Texas Engineering Association.

Bibliography

1. Reistle, C. E., Jr., "East Texas Production," A.P.I. Drilling and Production Practice, 1935, pp. 96-105.
2. Plummer, F. B., and Sargent, E. C., "Underground Waters and Subsurface Temperature of the Woodbine Sand in Northeast Texas," University of Texas Bulletin No. 3,138; October 8, 1931.
3. Zavoico, Basil, "Geology and Economic Significance of East Texas," World Petroleum, March, 1936.
4. Lahee, F. H., "The East Texas Oil Field," A.I.M.M.E. Pet. Dev. & Tech., pp. 279-294, 1932.
5. Levorsen, A. I., "The East Texas Oil Field," Inst. Pet. Tech., Vol. 8, No. 7, pp. 261-268, June, 1931.
6. Report of the subcommittee of nine on "Evils Attending Unnecessary Drilling in Proven Fields, and the Remedy," Independent Petroleum Association of America, Oklahoma City, Okla., December, 1936.
7. Lindsley, B. E., "A Study of 'Bottom-Hole' Samples of East Texas Crude Oil," U. S. Bureau of Mines, R. I. 3,312, May, 1933.
8. Reistle, C. E., Jr., and Hays, E. P., "A Study of Subsurface Pressures and Temperatures in Flowing Wells in the East Texas Field and the Application of These Data to Reservoir and Vertical Flow Problems," U.S.B.M., R.I. 3,211, May, 1933.
9. Reistle, C. E., Jr., "Paraffin Production Problems," A.P.I. Drilling and Production Practice, 1934, p. 72.
10. Schilthuis, Ralph J., and Hurst, William, "Variations in Reservoir Pressure in the East Texas Field," A.I.M.M.E., Pet. Dev. & Tech., 1935, pp. 164-176.
11. Nye, G. L., and Reistle, C. E., Jr., "Recent Changes in Reservoir Pressure Conditions in the East Texas Field," A.I.M.M.E., Vol. 107, Pet. Dev. & Tech. (1933).
12. Reistle, C. E., Jr., "Effect of Different Production Rates on Pressure Distribution in East Texas," A.P.I. Dallas, November 15, 1934.
13. Minor, H. E., and Hanna, M. H., "East Texas Oil Field," Bull. A.A.P.G., 1933, Vol. 17, pp. 757-793.
14. Knowlton, D. R., "The Future of Well Spacing," The Oil and Gas Journal, Vol. 35, No. 52, May 13, 1937, page 76.
15. Bays, George S., "Comments Made on 'The Future of Well Spacing,'" The Oil and Gas Journal, Vol. 35, No. 52, May 13, 1937, page 78.

Burner Sales Increase

Distillate and fuel oil burner orders are running 33 to 59 per cent higher so far this year than during 1936, according to statistics covering a majority of manufacturers. The rapid expansion of distillate and fuel oil burners during the first quarter may supply part of the answer to why fuel oil prices are firm to stronger in the face of normal seasonal decline in consumption.

During the first three months, distillate burner orders, less cancellations, totaled 46,792 in contrast to 19,224 through March, 1936. March was by far the most active month with a total of 25,534 orders, more than doubling business in February.

†"WEAPONS OF THE WEAK"— by Charles M. Russell

Today's Industry Reflects the Museum's Art

True art transcends eye appeal and becomes a practical servant of mankind. In this sense Axelson Pumps and Sucker Rods are truly works of art. ☆ Knowledge and skill handed down from the bronze age have been supplemented by knowledge and skill of the twentieth century. Man's control and use of metals have risen to amazing heights. The minds and hands of living men are daily employed in designing and processing selected steel to meet the demands of the petroleum industry. ☆ Axelson Pumps and Sucker Rods are the culmination of art and artisans for the practical purpose of producing oil. ☆ Axelson Manufacturing Company, P.O. Box 710 —Vernon Station, Los Angeles. St. Louis, Missouri. 50 Church Street, New York City. Tulsa, Oklahoma. Mid-Continent and Eastern Distributor: Frick-Reid Supply Corporation. Rocky Mountain Distributor: Great Northern Tool and Supply Company.

☆ ☆ ☆

†*Charles M. Russell had a great understanding of the West and its creatures. In this bronze, a mother bear with her two cubs has climbed on a wobbly rock for safety, as they watch a porcupine go by. Although the "porky" is small, all other animals respect his armour.* ☆ *This is the first time that permission has been granted for the reproduction of this bronze. A reproduction of this picture, suitable for framing, is available upon request.*

AXELSON PUMPS AND SUCKER RODS

Factors Causing Corrosion in Cracking Units

By F. L. NEWCOMB
Standard Oil Development Co., Elizabeth, N. J.*

In discussing corrosion in cracking units, one must consider the kind of crude from which the feed stock was cut. Many of the statements made in this discussion are based on experience with West Texas and other highly corrosive crudes. Many of the problems outlined may be almost nonexistent where Pennsylvania and similar crudes are handled.

When corrosive oils are handled, all types of corrosion may be encountered, and it may be found at any point. In some cases, it is plainly apparent that corrosion is occurring, as evidenced by pitting, grooving or similar effects. Much more frequently, however, the results of corrosion are not so plainly apparent. Frequently, the corroded surface is as smooth as the original surface. Also, the rate of corrosion may vary considerably from time to time with changes in character of the feed stock or with changes in the operating conditions. As a result, careful, systematic inspection is necessary to determine the amount of corrosion which has occurred.

Causes of Corrosion

A considerable proportion of the oil refined today contains various sulfur compounds, including hydrogen sulfide. Many of the sulfur compounds are unstable at the temperatures encountered and break down into their component parts. The free sulfur thus released unites with hydrogen from the oil and forms hydrogen sulfide. Some of the chemical reactions occurring and some of the compounds formed may be corrosive. Also, hydrogen sulfide in the presence of moisture is corrosive. The oil with the highest sulfur content is not necessarily the most corrosive for this is dependent, to some extent, on the character of the sulfur compounds present. However, any oil with appreciable sulfur content will cause sufficient corrosion to require careful, periodic inspection. Also, the corrosion caused by sulfur compounds accounts for the greater part of the losses found in cracking equipment.

Some oils contain salts with a chlorine base. These salts may break down and the chlorine unite with hydrogen to form hydrochloric acid. Wherever condensation occurs, this will cause typical acid corrosion as evidenced by pitting.

Other corrosion may be caused by the water used for cooling and condensing. At seaboard plants, where salt water is used, this may be a serious factor.

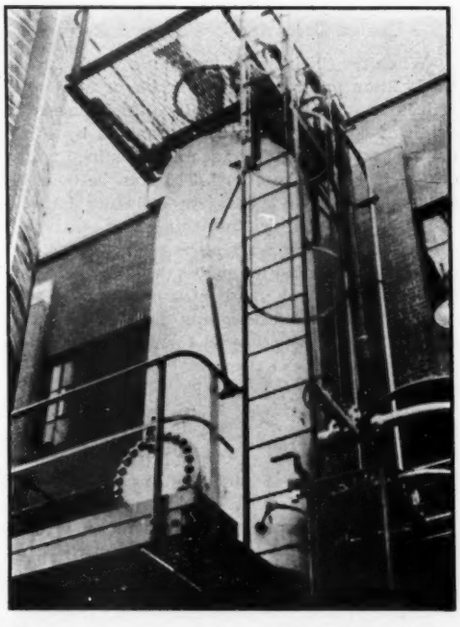
Rate of Corrosion

The rate of corrosion is dependent on so many factors that it can only be determined by experience. It may, and generally does, vary considerably between different parts of the equipment. In general, the parts subjected to oil at the higher temperatures will corrode at the greatest rate. Also, where high velocity accompanies high oil temperatures, excessive rates of corrosion may be expected. On the other hand, where the surfaces may become heavily coated with coke, the corrosion rate may be less severe than anticipated. This is probably due to the fact that the coke prevents free circulation of the oil and its corrosive contents over the metal surface for at least a portion of the run. However, coke deposits cannot be depended on to prevent corrosion.

Salt and Acids

Where salts are present and hydrochloric acid may be formed, severe and rapid corrosion may be found in the colder parts of the equipment due to condensation of the hydrochloric acid on the metal surfaces.

In a cracking unit, handling high sulfur stocks, the corrosion will probably start at a point where the oil reaches a temperature somewhat in excess of 500° F. As the temperature increases, the rate of corrosion will increase. Generally, it does not become excessive until a temperature of 700° F. or over is reached. Thus, the feed side of oil exchangers and the preheater tubes of the furnaces generally suffer only nominal corrosion. The radiant and soaker tubes, transfer lines, reaction chamber, release line and separator will probably suffer very severe corrosion. In many cases, part of the bubble tower will also suffer quite severe corrosion. Where both a primary and secondary bubble tower are used, severe corrosion may carry well through the primary tower. While the oil is reducing in temperature, quite severe corrosion may be experienced down to nearly 500° F. and nominal corrosion down to 350° F. It should be noted that, after the oil has been raised to a high temperature, it is more corrosive at lower temperatures than is the case during the heating period. This is probably explained by the change in character of the sulfur compounds which occurred at high temperature.



Warm propane tank in Kendall Refining Co.'s propane dewaxing and deresining plant at its Bradford, Pa., refinery

Another factor appearing to affect the rate of corrosion is the amount of protection used against corrosion in the higher temperature parts of the equipment. Where corrosion-resistant tubes and lines are used, and the reaction chambers are protected against corrosion, it appears that the rate of corrosion in the separator and bubble tower is increased. The further the protection is carried, the greater becomes the corrosion rate in the lower temperature equipment until the oil reaches some temperature at which it is no longer corrosive.

Protection Against Corrosion

There are three general methods of protecting against corrosion, namely:

1. Use of corrosion-resistant material.
2. Lining with some material which will prevent the oil from reaching the surface of the vessel.
3. Coating the surface of the metal with another corrosion-resistant metal.

Use of Corrosion-Resistant Material—Parts composed entirely of corrosion-resistant material are usually those which cannot be lined or coated. These generally consist of tubes, headers or return bends (or those parts of them exposed to the oil), piping and valve trim. The two most common metals used are KA2S and 4 to 6 per cent chromium molybdenum steel. The KA2S is an 18 per cent chromium, 8 per cent nickel steel having a carbon content of less than .07 per cent. It is practically totally resistant to attack by any of the highly corrosive oils handled today. The 4 to 6 per cent chromium-molydenum steel contains 4 to 6 per cent chromium and approximately one-half per cent of molybdenum to reduce the tendency towards air hardening. In some cases, 1 per cent of tungsten is used in place of the molybdenum. This steel is more resistant to corrosion than carbon steel but is not totally resistant. The corrosion rate may be anywhere from one-fifteenth to one-third that of carbon steel, dependent on the character of the oil and the conditions of operation. Generally, it appears that this material is less corrosion resistant to the more corrosive oils.

There are other corrosion-resistant alloys suitable for linings which are not suitable for use in making entire parts due to their tendency to lose ductility and thereby lose their ability to withstand shock.

Lining—Many different linings are in use today affording more or less protection.

Steel vessels may now be obtained with corrosion-resistant alloy linings which are an integral part of the sheet or which are welded to them by electric resistance welding at very close intervals. The alloy used may be any of the corrosion-resistant alloys but preferably should be one having a coefficient of expansion close to that of the carbon steel shell. Both of the above linings are formed with the sheet, the welded lining being installed while the sheet is flat. A new vessel of this type

*Presented at the May 6, 1937, meeting of the Warren Group of the Department of Manufacture of the National Petroleum Association, Warren, Pa.

construction appears to have the best obtainable protection known today.

Existing vessels may be lined with corrosion-resistant alloy sheets installed in place. These sheets are usually cut narrow enough to pass through the largest existing opening and are plug welded to the shell at frequent intervals and edge welded to exclude oil, using an alloy welding rod and electric arc welding. These appear to be very effective in preventing corrosion and should require little maintenance, if properly installed with good, sound welding.

Reinforced gunite, asbestos mud and similar linings are also used with varying degrees of success. They require more or less frequent maintenance and periodic replacement. The life of such a liner may vary from six months to two or three years, depending on the degree of maintenance and severity of operating conditions. They do not give complete protection since, at times, portions of them break out and expose the metal until repaired. They do retard the corrosion and, under not too severe conditions, are quite successful. Pipe fittings and valve bodies may be lined with corrosion-resistant alloys.

Coating — Metal spray coating is also used for preventing corrosion. Most metals can be sprayed but aluminum seems to be the most commonly used. Such coatings will give complete protection as long as they remain intact. They require more or less maintenance and patching. There will be some losses with such coatings where the vessel wall is exposed between failure and time of recoating.

In addition, caustic and ammonia have been injected into various parts of the units to partially neutralize the corrosive agents. Generally, this has caused other complications not desirable. At best, it can only reduce the rate of corrosion.

Inspection

Since corrosion is known to occur at varying rates with different oils, different conditions of operation and in different parts of the equipment, it is essential to inspect all parts of a cracking unit to determine its condition and to assure that it is safe for further operation. The attitude of the inspector should always be that he may find corrosion anywhere until he has assured himself that there is none. Whenever any change is made in the operation of a piece of equipment, whether it is a change in pressure, temperature, character of the contents, substitution of a corrosion resistant material for one which was formerly badly attacked, or any other change, the inspector must again take the attitude that corrosion may be found at any point where previously it had not been experienced.

Some of the points where most serious corrosion is to be expected are as follows:

In vessels containing corrosive liquids, the most serious corrosion is frequently at the liquid level. However, sufficient investigation of the remainder of the equipment must be made to determine if this is the case.

In vessels through which vapor or gases flow, the most serious corrosion is frequently experienced in the vicinity of the inlet.

In piping through which fluids are flowing, it is generally safe to assume that the higher the velocity, the greater will be the corrosion. Also, at points where turbulence occurs, the corrosion will probably exceed that found at other points.

Gate valves frequently are found to be seriously affected in the body between seats and particularly so, if they are used for throttling purposes.

There are many different ways of determining when corrosion has occurred and the extent of same. However, methods applicable to one kind of equipment or material may not be applicable to another kind. Each inspector has to use his own judgment as to the method or combination of methods necessary for any piece of equipment.

Visual—In general, everything should be given as thorough a visual inspection as possible. Where possible, the equipment should be entered and where this is not possible, the best visual observation feasible from the outside should be made. During such examination careful note should be made of any pitting, grooving, cracking, checking, scaling, bulging or other irregularities, or doubtful conditions. Points where defects or doubtful conditions are found should be further investigated by other methods to determine the amount of sound metal remaining. In the case of lined or coated parts, particular care should be taken to see that the lining or coating is in good condition and is protecting the metal beneath it.

During the internal inspection of towers and drums, and similar equipment, all interior equipment should be carefully examined. Particular attention should be given to the supports of piping coils, trays, pans and so forth, to see that they are adequate to carry the load. In riveted vessels the heads of all rivets should be examined for corrosion, undercutting or other deterioration, since their condition gives a quick and reliable indication of the location of the most severe corrosion. The condition of all attached piping, nozzles, manheads, etc., should be observed from the interior of the vessel.

An exterior examination should also be made for any unusual conditions. All attachments to vessels should be observed and particular attention given the supporting members to see that they are in condition to carry the load.

Sounding with a hammer to determine thin areas, loose rivets, etc., should be employed when applicable.

Thickness Determinations — Several different methods may be employed for determining the remaining metal thickness after corrosion. In the case of vessels, this will depend on the thickness of the vessel wall and its position. For determining the thickness of a vessel from three-sixteenths inch to 2 or 2½ inches thick, it is usually feasible to drill small holes at the point one desires to investigate and later tap these holes with a pipe or tapered tap and plug them so they can be used during future inspections. In some cases, it may be advisable to permanently plug such holes by welding or other means and drill new holes at subsequent inspections.

Use of Corrosion-Resisting Buttons

When the thickness of metal in a vessel is definitely known and it is not desirable or feasible to drill holes for determining future thicknesses, the depth of corrosion may be determined by establishing protected surfaces at predetermined points on the inside of the vessel. This can be done by welding on corrosion-resistant strips or buttons and later removing this protection and measuring the depth of corrosion from the protected surfaces under them. Another method is to drill small holes on the inside of the vessel at suitable places to a predetermined depth. Plugging these holes with a protective material prevents corrosion at the bottom. Loss in depth of the holes represents the loss in metal thickness by corrosion.

When it is necessary to determine the wall thickness of vessels and it is not feasible or desirable to drill completely through the wall, two taut parallel wires, one inside and one outside the drum, may be used. The metal thickness is then obtained by measuring the distance from each wire to the corresponding adjacent surface of the vessel wall and deducting the sum of these readings from the distance between the wires.

In some cases, wall thickness of vessels may be estimated by measuring the inside diameter with inside micrometer calipers. In such cases, the wall thickness must necessarily be figured as one-half the difference between the inside and outside diameters. The outside diameter is usually known but if not, it must be determined. Since some of the corrosion found in petroleum vessels is not uniform, this method may result in considerable error and should not be used if the thickness can be determined by any other method and, in any case, should be used only with discretion.

Thickness of Tubes

To determine the thickness of tubes in the furnace, it is obviously impossible to make an accurate check of the wall thickness for the full length of the tube, due to its length. Therefore, approximations of the tube wall thickness have to be made from inside and outside diameters. Where little corrosion is experienced, it may be sufficient to take inside diameters with a pair of long calipers, reaching into the tube as far as possible. Where severe corrosion is experienced, this is usually not sufficient because the corrosion may not be uniform and may be much more severe in the center of the tubes than at the end. In such cases, it becomes necessary to use a special tube micrometer with which measurements can be taken to the middle of the tube from either end.

External measurement of tubes is necessary only at points where bulging or eccentricity is noted, since the outside diameter tolerance of the tube is less than the error of internal diameter measurement or the error resulting from assuming the wall thickness to be one-half the difference of the diameter. Such outside diameters as are required can be readily taken with calipers.

The wall thickness of header boxes or return bends joining the tubes can usually be measured by indicating or transfer calipers, using specially shaped legs on the calipers.

The wall thickness of pipe near the ends, and of valves and fittings can be determined by the use of either transfer or indicating calipers. In fittings, particular attention should be given to the wall thickness at points where change in direction of flow takes place. Straight lengths of pipe may have the internal diameter measured by means of a tube micrometer when general corrosion or bulging is suspected or indicated by other examinations. Frequently, hammer testing of pipe is used for estimating the thickness. This should not be confused with sounding, which is used to detect thinner areas by change in tone. In hammer testing pipe, a sufficiently heavy hammer must be used and a sufficiently strong blow must be struck to actually cause an indentation of the pipe wall if it is below the minimum allowable thickness. This test calls for considerable skill on the part of the inspector, since each different limiting thickness requires a blow of different intensity. Only practice and experience can teach an inspector how to use this method. On the other hand, an inspector really experienced in this method of determining thickness will come surprisingly close in judging the exact intensity of blow required to determine a given thickness. It is a method which every inspector should acquire since it can almost always be employed when no other method of determining the wall thickness of pipe is feasible. This method should never be employed while the pipe is in service or contains any flammable liquid or gas.

Safety Drilling

As a supplement to wall thickness determinations, safety drilling may be employed. This consists of drilling small holes (three-thirty-seconds or one-eighth inch) in the outer wall of pipe, fittings or vessels to a depth just equal to the minimum allowable thickness. The drill used for this purpose should be sharply pointed so that when corrosion occurs to the bottom of these holes the first leakage will be very slight. These holes should be spaced closely enough to give a fair idea

of the condition of the entire part and particularly at points where experience has indicated the worst corrosion occurs. When leakage occurs through one of these holes, it is known that corrosion has occurred to a point where the metal remaining is the minimum for safe operation. This method is particularly applicable to pipe bends, flared type nozzles, large piping where joints cannot be readily opened for internal inspection, piping in inaccessible locations, and vessels which cannot be entered for observation. One method of safety drilling, outlining in detail the spacing of holes, etc., is covered by a U. S. patent.

Detection of Graphitization

Under certain conditions, the iron content of cast iron will leech out, leaving the graphitic content intact. This is known as graphitization. The wall of the casting will remain its original thickness, unless there is erosion, and the appearance of the material will not change other than to appear slightly darker. However, since the surface of a casting is usually discolored or coated by foreign substances, visual examination will not generally reveal this condition. Since this graphitic material has practically no strength, it is important to determine the depth to which such deterioration has progressed. This material can be cut or scraped about as easily as the lead in a hard lead pencil. Therefore, scraping the surface of an iron casting with a pointed or sharpened instrument; applying a fair amount of pressure during the scraping, will reveal this condition. If graphitization is indicated, it should be removed in spots until sound metal is reached. The entire wall thickness can be graphitized and not be detected by visual examination. The condition may be caused by external conditions or by the material carried in the casting. Therefore, iron castings should be examined, both internally and externally, for this condition.

Briefly, serious corrosion does occur in cracking units. It may be found at any point in the equipment. The amount and character of the corrosion experienced is dependent on many factors, including impurities in the oil, temperatures attained during operation, velocities, materials of construction, and many others. Corrosion resistant materials and protective linings are being used where corrosion is severe and they are economically justified. In order to keep the equipment safe, it is necessary to make systematic periodic inspections so that the amount of sound material remaining is known and replacements can be made or protective measures can be taken when necessary.

French University Producing Specialized Technicians

By DR. P. M. EDMOND SCHMITZ*

The creation of the French school for the study of petroleum and combustible liquids at Strassburg was in settlement of the Allies' victory, Alsace having become an integral part of France. While only limited funds have been available, the institution has attracted professors of ability who have drawn the attention of eminent technologists to the school.

It is unquestionably true that the first thesis about petroleum was presented in 1724 by an Alsacian, Hoffel of Worth, before the medical faculty of the University of Strassburg. It was entitled "Historia balsami mineralis Alsatic seu petrolei vallis Sancti Lamperti." L'Ecole du Petrole of Strassburg was founded in 1924 as a result of an agreement between the Ministries of Commerce and Education Nationale, l'Office National des Combustibles Liquides (O.N.C.L.) and the University of Strassburg. The essential purpose of this school is to produce specialized technicians such as geologists, chemists and engineers for the petroleum industry, and the chemical industries related to the petroleum industry. Only those who have completed university work are permitted to enter the courses of this school.

Three series of courses are given in the school: (1) General courses, such as statistics, accounting and commercial sciences, by J. Filhol (O.N.C.L.), H. de Cizancourt (Cie Francaise des Petroles), L. Forissier (Pechelbronn), C. H. Bossuat, (Director General des Douanes au Ministere des Finances), and J. Vidal (Ste des Petroles Jupiter). (2) Chemistry, physics and geology courses are divided as follows: Prof. H. Weiss, director of the school, presents a course of physico-chemistry on combustible liquids and chemical engineering; Prof. G. Hugel offers a course on the chemistry of combustible liquids, cracking, hydrogenation, technology of petroleum and tars, and synthetic combustibles; Prof. L. Boisselet conducts a course on general and special analysis of combustible liquids, lubricants, asphalt, ozokerit, oil shale, etc.; Prof. F. Vles instructs in special methods of physical chemistry; C. H. Bihoreau, technical director of O.N.C.L., teaches refining technology, distillation, dewaxing, chemical refining, and cracking.

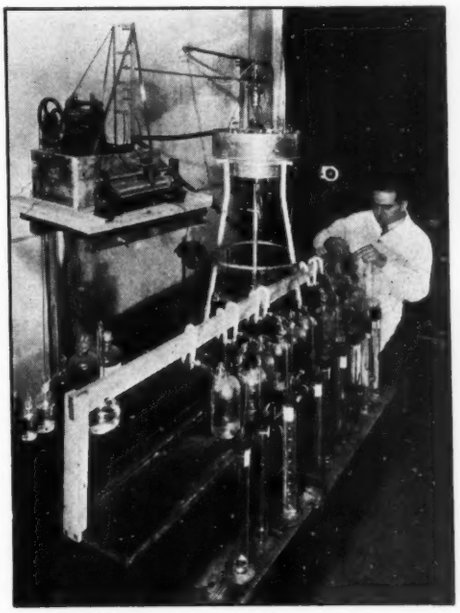
This series of courses is completed by those given by the following instructors: H. Rimailho (Pechelbronn-Ouest), refinery equipment; L. Chove (Ste Jupiter), storage and transportation of petroleum and its derivatives; P. Dumanois, aeronautic construction, with lectures on the explosion motor and internal combustion; M. P. Woog (Cie Francaise de Raffinage), modern processes of lubrication; P. M. Edmond Schmitz (Petrofina), by-products of petroleum; acid and alkali sludge, its composition, recovery and utilization; and asphalt and naphthenic acids.

University of Strassburg in which petroleum and combustible liquids are studied

Combustible liquids, their utilization and the use of alcohol and benzol as substitutes or additives of gasoline are the subjects of lectures given by MM Ch. Mariller, professor to Ecole Nationale des Industries Agricoles de Douai. L. Duzan (Ste Jupiter) and L. Jacque (Ste des Carburants et Produits de Synthese).

For geologists the following are given: Applied geology, stratigraphy, micro-paleontology, applied hydrology, etc., by Prof. D. Schneegans; Prof. K. Alexanian leads a class in geophysical methods of prospecting; the subject of interpretation of material found in research and in theoretical topography is dealt with by Prof. Jung, in conjunction with Messrs. Cagniard and Adam.

R. Levy, Chief Engineer of Mines, completes the course with lessons in law of petroleum, labor contracts, etc.



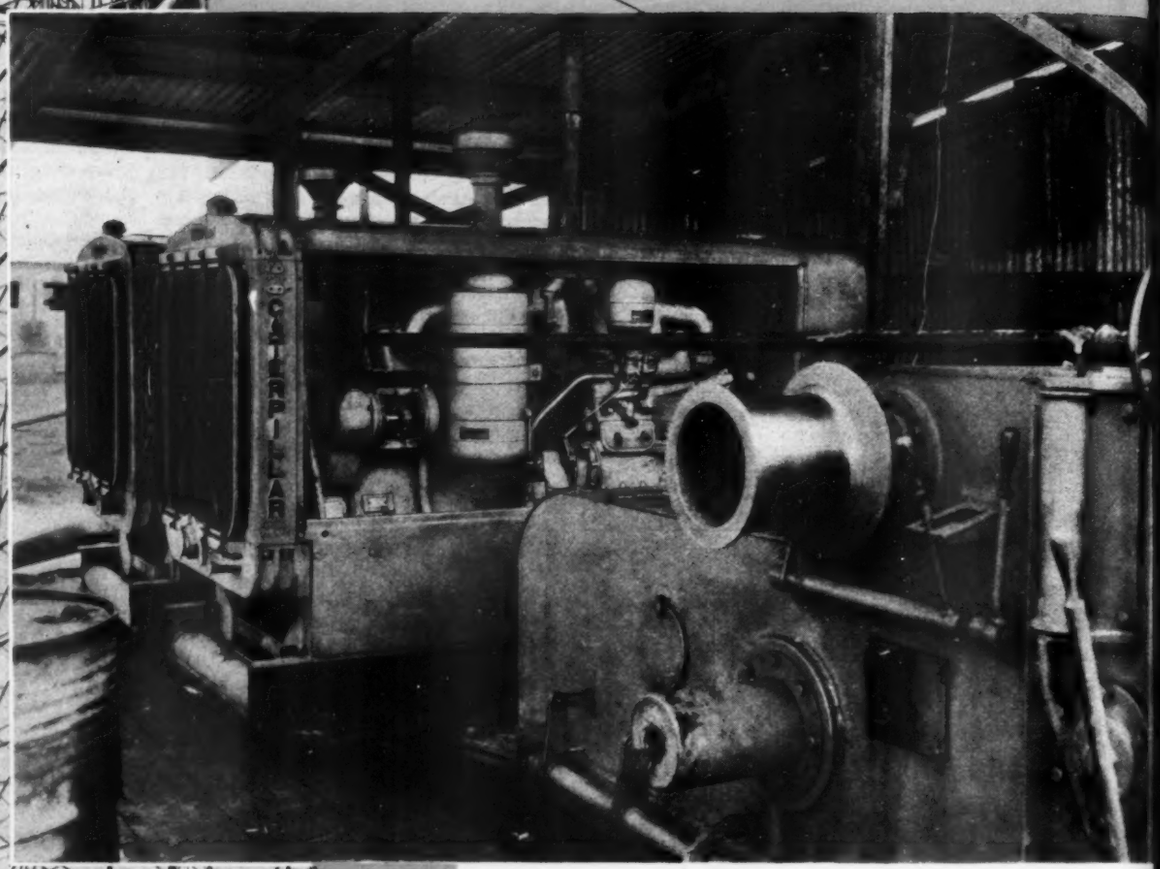
Photolyse of gasoline and oils is among the many subjects studied at the school

The Ecole Nationale Superieure du Petrole de Strassburg has special laboratories for the analysis of all combustible products, and the study of new methods of analysis, as well as organic laboratories, in which, under the direction of the above-named professors, all new problems concerning the petroleum industry in general are studied. For instance, in the physico-chemical laboratories, under the direction of Prof. H. Weiss, ably assisted by Professors Louis and Yanaquis, scientific studies are often made by means of special methods found and perfected by the professors themselves. Technical material is covered, such as problems relating to the physico-chemistry of petroleum; high vacuum distillation, the passage of gas and liquids through finely pulverized bodies, calorific capacity, viscosity, plasticity, polymerization, oxidation and regeneration of oils.

Naturally, the French, who come from the universities or special schools, are in the majority and are trained in Strassburg before entering the industry. But the reputation of the faculty draws other nationalities and there are some students who are sent by the governments of their country. The proximity of Pechelbronn — some few miles from Strassburg, where the extraction of crude oil is made both by drilling and by means of shafts and galleries allow the students an excellent practical lesson.

*Technical manager of the refinery department of Petrofina, appointed assistant professor for a series of lectures at the Ecole Nationale Superieure du Petrole de L'Universite de Strasbourg.

Well Drilling or



SEVEN ENGINE SIZES

D17000 . . 8 cyl. . . 160 hp.
D13000 . . 6 cyl. . . 125 hp.
D11000 . . 6 cyl. . . 100 hp.
D8800 . . 4 cyl. . . 80 hp.
D7700 . . 4 cyl. . . 66 hp.
D6600 . . 3 cyl. . . 60 hp.
D4400 . . 4 cyl. . . 44 hp.

CATERPILLAR

REG. U.S. PAT. OFF.

CATERPILLAR TRACTOR CO., PEORIA, ILL.

WORLD'S

Line Pumping—

DIESEL DOES IT AT LOWEST COST

AT THE LEFT you see a pair of "Caterpillar" Diesel 125-hp. Engines operating a rotary drill rig in the Oklahoma City field. Below you see the same size engine driving a 5x10 gear pump in one of the Texas fields . . . pumping 250 barrels of crude oil per hour through a 4-inch discharge into an 8-inch main . . . *at a fuel-and-lubrication cost of only 18c an hour.*

On all types of work in the oil fields — rotary rigs, cable tool rigs and spudders; pipe-line and production pumping; electric generators—"Caterpillar" Diesel Engines are demonstrating their versatility, proving their ability to "take it" under the toughest kind of going, and cutting power costs by a half to three-fourths.

Five to ten thousand hours of repairless service is not unusual with these modern exponents of the Diesel principle of power production. The pumping engine in the picture below, for instance, has already seen more than 8000 hours of practically continuous duty. And it is still "young"!

LOW PRICES of "Caterpillar" Diesel Engines with their high standard of quality are made possible by large-volume production. . . . These engines are used in thousands of tractors and road machines, in the equipment built by 83 machinery manufacturers, and by hundreds of other power users.

DIESEL ENGINES

LARGEST MANUFACTURER OF DIESEL ENGINES

Use of Filter-Aids in Improving Quality of Refined Products

By F. L. HORINE
Johns-Manville Corp., New York City

The constant growing demand for maximum revenue from refined oils to meet more expensive operating conditions and to produce better quality products to attain this result have fostered many improvements in original processes.

Filtration has long occupied an important place in producing petroleum products of desirable standard, but under certain conditions the conventional equipment and methods have proven either too expensive or tedious for practical application. The chief difficulty in filtering certain types of stock is in plugging filter cloths requiring frequent replacement and more frequent cleaning. If the suspended matter to be removed is very small or slimy, as is often the case in petroleum refining, it is frequently impossible to obtain a filter fabric which will retain the fine solids, also the cloth becomes plugged and the filter must be cleaned at short intervals, an expensive item as is the frequent renewal of filter fabrics.

To overcome some of the petroleum refining industry's filtering problems, a product, which is almost pure silica in chemical composition, has been developed. The product, known to the industry as Celite filter-aids, has been growing in favor among certain refiners until the petroleum industry's consumption now averages about 1,500 tons annually. Although use of these filter-aids is not exclusively confined to the petroleum industry, it has been found especially suited to filtering of cracking plant residual oils and tars and to certain types of oils in removal of wax, ash and other filterable particles.

Uses in Oil Industry

Certain cracking processes are productive of a very heavy oil or tar residue which can be disposed of at greatest profit as road oil or fuel oil, provided that it can meet the specifications for those materials. Such residual oils are usually too high in separated carbon and other impurities to meet the ash and b.s. specifications, particularly for fuel oils. Where the charging stock must be lime treated to minimize corrosion, the usual amount of foreign matter and carbon is increased by the fine calcium sulfide and reacted lime. An inexpensive method of purification of such residues is filtration. A filter must be used which will stand the filtration pressures and temperatures involved.

Due to the high temperatures involved, only a metal filter screen can usually be considered, and a metal screen fine enough to retain the undesirable solid suspended matter cannot be made. So the regular procedure is first to precoat the screens with 50 to 100 pounds of filter-aid suspended in previously filtered tar oil, or better still, suspended in cycle oil. It is difficult to keep once-filtered tar oil hot for precoating purposes. A more simple process is to use gas or cycle oil which can easily be held at 200 to 300° F. since with a little makeup, this lighter precoating oil can be used over and over.

The suspended filter-aid in cycle oil is pumped through the filter and the filtrate is led back to the suspension tank. This circulation is maintained for 10 to 15 minutes. By that time substantially all of the filter-aid has been transferred to the face of the filter screens. The tar oil itself is then turned to the filter and the circulation stopped. It is essential that no large drop in pressure on the filter occurs while changing the filter over from circulating oil to tar oil. A bad pressure drop might allow some filter-aid precoat to drop from the filter screens. In such a case, the carbon, lime, etc., would contaminate and plug the bare sections of the screen. Also, some would pass through into the filtrate. No filter-aid is incorporated in the main body of the tar oil being filtered as the cake formed is fairly porous and flow rate is good until the available cake space in the filter becomes well filled.

The following table, based upon the operation of a typical plant, gives definite proof of the low costs involved in a filtration of this type.

SUMMARY DAILY COST

(Filtering 8,000 bbls. residue daily—basis 300-day year)

1.	Daily change to investment and depreciation at 16 per cent (investment in 8 Kelly filters, accessories and building)	$ 35 00
2.	Daily charge to direct labor—15 men at 42 cents average	45 00
3.	Daily charge to filter cloth	10 00
4.	Daily charge to Celite filter-aid	50 00
5.	Daily charge to steam, power, etc.	30 00
6.	General maintenance	5 00
	Total cost per 8,000 bbls., per day	$175 00
	Cost per barrel	.22

Removal of Wax

A novel use for the filter-aid has been developed in connection with dewaxing of certain types of oils. The novelty lies in the fact that the filter cake, consisting of filter-aid and wax, is not a waste product as in the usual filtration, but is treated in a simple manner to reclaim both the wax and the filter-aid. The filter-aid is, of course, reused and, therefore the only new filter-aid needed for such a process is the makeup made necessary by the small losses due to handling.

Developments of refining methods have made necessary the production of certain types of lubricating oil stocks which proved difficult to dewax by the conventional methods. These types vary from some paraffin distillates to residual stocks, and include stocks which have been only partially dewaxed by usual methods. In almost every case the difficulty is caused by one or more of such reasons as the impossibility of chilling out a wax which is not soft or of very fine particle size, the fact that the wax separates in very small or very large amount, or the fact that the wax approximates in specific gravity the specific gravity of the suspending oil-diluent mixture. The new trends in refining methods, such as the various solvent extraction processes, the substitution of other solvents than naphtha for diluting the oils to be dewaxed, and the use of a combined solvent-refrigerant, all promise a greater application in the future for filter-aid dewaxing. The basic point is that the method will remove all of any type of wax from any wax-bearing oil and do everything from recovering good pourtest oils from the petrolatum discharge of other processes down to removing the small wax cloud from some asphalt base oils.

A short resume of this process should be of interest here. The oil to be dewaxed is diluted with the necessary amount of solvent and warmed. The wax is then crystallized, first cooling through the exchangers with outgoing oil and then refrigeration. The sufficiently chilled solution ("shock" chilling is usually not detrimental) is then led into an insulated mixing tank to which a constant stream of recovered filter-aid is also being added. From this mixing tank the suspension of wax and filter-aid goes to continuous vacuum or pressure filters. The cotton filter cloths remove the wax and filter-aid particles. The filtrate is the dewaxed solution. This is removed to the stripping still through the heat exchangers.

The cake on the filter cloth is washed through with cold solvent to increase the yield and may also be partially dried in place with cold flue gas or other inert gas. The cold wash can be returned for dilution purposes to the insulated mixing tank. The cake is then discharged into an agitated vat containing the weak wax wash solvent from the filter-aid recovery filter. The slurry so formed is warmed to dissolve the wax from the filter-aid and the suspension of filter-aid in the wax-solvent mixture is led to a drum type continuous vacuum filter. Here the filter-aid is removed on the cloth, washed free of wax with a fresh, warm solvent spray and partially dried with flue or other inert gases. The filter-aid is returned to the cold mixing tank for reuse, the solvent-wax solution goes to stripping still storage and the weak wax wash solvent is used to puddle up more cake in the vat. In the whole process, great care must be taken to prevent the filter-aid from becoming water wet. This wetting may occur if the filter-aid is exposed to air when cold and it is for that reason that the entire filter system contains flue or inert gas in every place instead of air.

The question of whether a closed pressure filter or a drum type vacuum continuous filter should be used for the first—cold or dewaxing—filter is largely dependent upon the exact type of oil which would be handled in greatest amount.

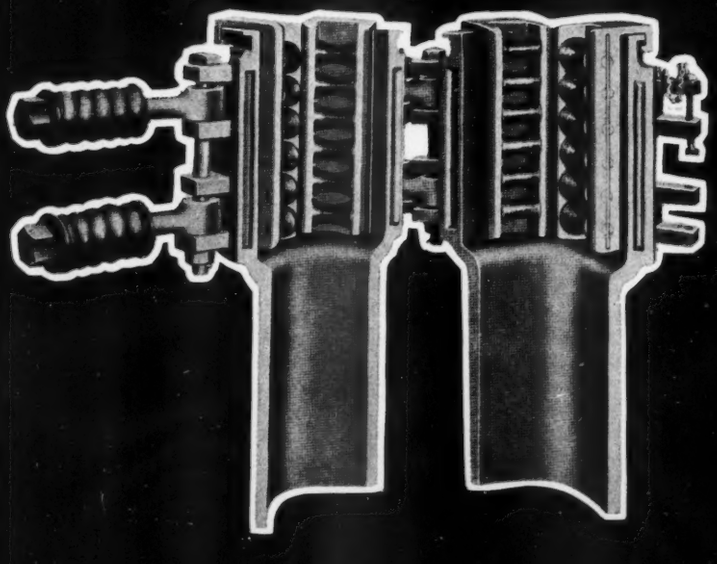
It should be noted that most filter-aid or dewaxing processes are covered by the Weir or other patents.

Use as a Catalyst Carrier

In addition to their excellent qualities as filter-aids Celite diatomaceous silica products are particularly suited as carriers or compounding materials for catalysts. In the allied industry of sulfuric acid manufacture, the hydrogenation of fats and oils, and polymerization of low fraction distillation products they are finding increasing usage.

The porous structure and low specific gravity of the product, having a settled density of approximately 10 pounds per cubic foot, as well as the

DRILL IN UNDER PRESSURE
DRILL IN WITH OIL



With the W-K-M HAUSER ROUND KELLY DRIVE

Through use of this modern tool operators in many fields are now eliminating the unwieldly square Kelly during the process of well completion. They use instead a joint of drill pipe or tubing as a Kelly, and drill in under pressure with absolute safety. They are also drilling in with oil, avoiding the necessity of washing the well. The W-K-M Hauser Round Kelly Drive is giving its users numerous advantages over other drilling in methods. The blowout preventer rams may be closed without having to pick up to clear rams with the Kelly. Each full length may be run without a shut-down. And there are other valuable features provided by the Round Kelly Drive.

Flexible, self-adjusting roller racks allow for misalignment. These racks provide a positive drive for rotation, yet are entirely "free-wheeling" in upward or downward direction.

Available for 2", 2½", 3" and 4" drill pipe or tubing.

Ask for full details or question any of the large number of users about the efficiency and economy of this modern method of drilling in wells.

W-K-M Company, Inc.

OIL FIELD, PIPE-LINE & INDUSTRIAL EQUIPMENT

HOUSTON, Texas, U. S. A.

Export Office: 74 Trinity Place, New York

Cable Address: "WILKOMAC"

chemical inertness of its silica composition, are emphasized. These properties all make for an ideal catalyst carrier or corresponding agent as a large reactive surface is available for a small unit of volume of weight. In practice, the surface of the Celite is either coated with the active material or else the catalyst is mixed with the active material in preparation of the final catalytic body. In either case, the catalyst mass may be dispersed through a liquid and later removed by filtration, or in some cases, a vapor or liquid may be passed through a stationery bed of the mass.

Emulsion Breaking and Dehydration

When petroleum emulsions are filtered through a film of the filter-aid which has previously been deposited upon the cloths by passing through the press, a suspension of filter-aid in clean oil or water in the emulsion is completely broken and the separation of oil and water in the filtrate is practically immediate. The use of filter-aids in breaking emulsions is applied both to crude oils and to the various emulsions which are at times unavoidably produced at the refinery. Emulsions containing salt in either the solid or liquid phase, can be desalted. Should the emulsion contain slimy suspended matter, it may be necessary to use some filter-aid in the emulsion itself in order to maintain a good rate of flow for long periods.

The pores in the filter-aid film are so minute in size that the oil water emulsion is torn apart by passing through the fine capillary channels; both the oil and water passing through the film to appear on the filtrate side of the cloth as drops of water and drops of oil. The drainage surfaces of the press are so arranged that there will be a minimum amount of roiling after the emulsion has passed through the film. The filtrate from the press is collected in storage tanks and, under certain conditions, it may be desirable to hold it under pressure. The water and oil separate with this method.

The cost of the filter-aid and labor required for this emulsion breaking operation depends entirely upon the type of oil. In many cases a 600-square-foot press will produce from 1,200 to 6,000 bbls. of dried oil in 24 hours using the labor of one operator. The rates of flow will vary from 0.1 to 0.5 bbl. per square foot of filtering area per hour. The cycle time varies according to the oil from less than a day to several weeks, the average being several days. The filter-aid consumption will vary from 0.01 to 0.1 pound per barrel of dry oil recovered.

Certain phases of dehydration are covered by U. S. Patents No. 1501877, 1547712, 1569695 and 1579171, owned by Johns-Manville.

As previously stated, filter-aids are not true absorptive bleaching materials in the sense that fullers earth and the acid treated clays are. The filter-aids are used, however, in conjunction with the true mineral decolorizers in order to obtain certain secondary though highly important results. One of these uses is in connection with the contact bleaching process, wherein the decolorization is carried out by agitating a finely divided bleaching agent such as fullers earth in the oil and then removing the clay by filtration of the slurry through a pressure filter. Filter-aid is used in the ways to be described not only with oils but also as a whole or in part to the processing of gasoline and kerosene when acid treatment without rerunning can be used. Residual acid (and clay, if used) is completely removed.

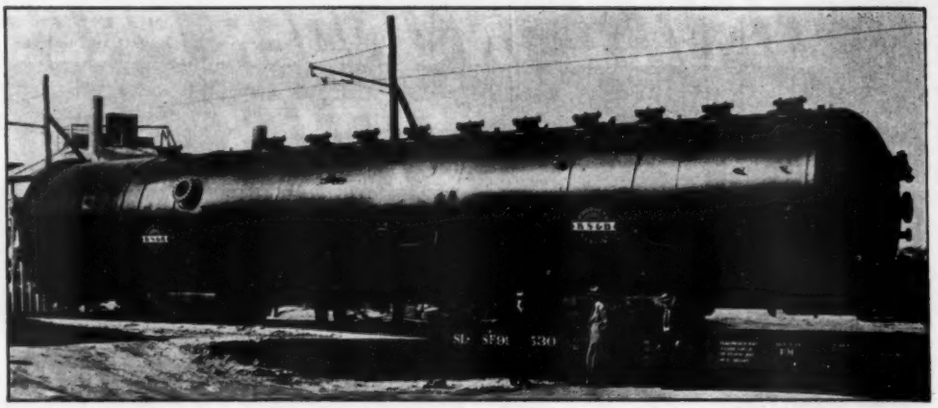
When excessive amounts of pepper sludge exist in an oil to be bleached, it may be profitable to prefilter it with filter-aid in order to reduce later bleach consumption and to obtain better bleach flow rates. This can be done on any pressure type of filter by first precoating with the filter-aid in previously filtered oil, and then filtering the oil which is later to be bleached. Should the oil to be filtered contain an excessive amount of pepper, a little filter-aid incorporated in that oil before filtration will cause the formation of a more porous filter cake, and so enable longer and higher flow rates to be obtained. For this sludge particle filtration, a special grade of acid resistant blue asbestos filter cloth may be necessary.

In the filtration of fullers earth from the bleached oil, it is often advantageous to precoat the filter with a filter-aid in previously bleached and filtered oil. Some refineries accomplish the same purpose by refiltering the contacted oil through a secondary filter precoated with filter-aid. This insures a bright oil having a good emulsion test, and is especially desirable when using very fine clay. In any case where filter-aids are used the metal filter cloths are protected from clogging and corrosion, and a filter cake is obtained which is easily removable from the cloths.

When fine clay is used for bleaching, it is sometimes desirable to add 5 to 10 per cent of filter-aid, based upon the weight of the clay used, to the oil-clay mixture prior to pumping it through the filter-aid precoated filter. The function of this filter-aid in the oil-clay slurry is to produce a more porous clay cake. This enables the operator to filter more rapidly and to run to a thicker filter cake. Oil loss on steaming or blowing is also reduced.

From the five specific uses of filter-aids in petroleum refining already described, the basic properties of these materials should be evident. There is one property they possess, however, which has not been mentioned and that is the peculiar one of completely removing small amounts of moisture from suspension or solution in hydrocarbons. An accurate measure of this property is shown by the increase in the dielectric strength of the oil.

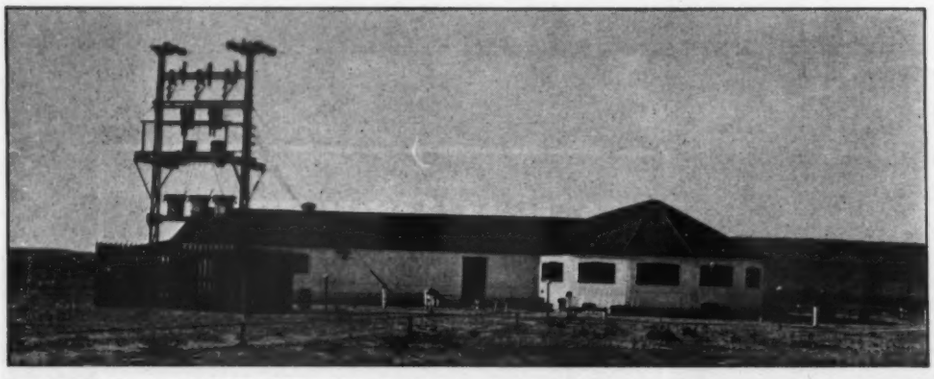
Large Tower Shipped to Oklahoma Refinery



Bubble tower ready for shipment from Oklahoma City to the refinery of the Anderson-Prichard Oil Corp., Cyril, Okla. This tower is to be installed as a part of an extensive enlargement program being conducted at the Cyril plant of the company which, when completed, will double the capacity of the crude throughout and the production of the various refined oil products. The tower was fabricated by Black, Sivalls & Bryson of Oklahoma City and weighs, together with its attachments, approximately 235,000 pounds, or 103 tons. The shell is of three-quarters inch welded steel plates. The height is 74 feet. The diameter is 12 feet, and with attachments, 13 feet. It contains 20 fractionating decks. Upon completion it was placed in a special gas-fired furnace, the fifth largest in the United States, and the heat was brought to 1,150° F. and held at that point for one hour, then allowed to cool in order to relieve the stress and strains from the welding process.

The Frisco Railway was confronted with a big problem in connection with shipping this tower. There was a clearance of only 2 inches on either side in passing through some of the bridges between Oklahoma City and Cyril, the shipment moving in a special train.

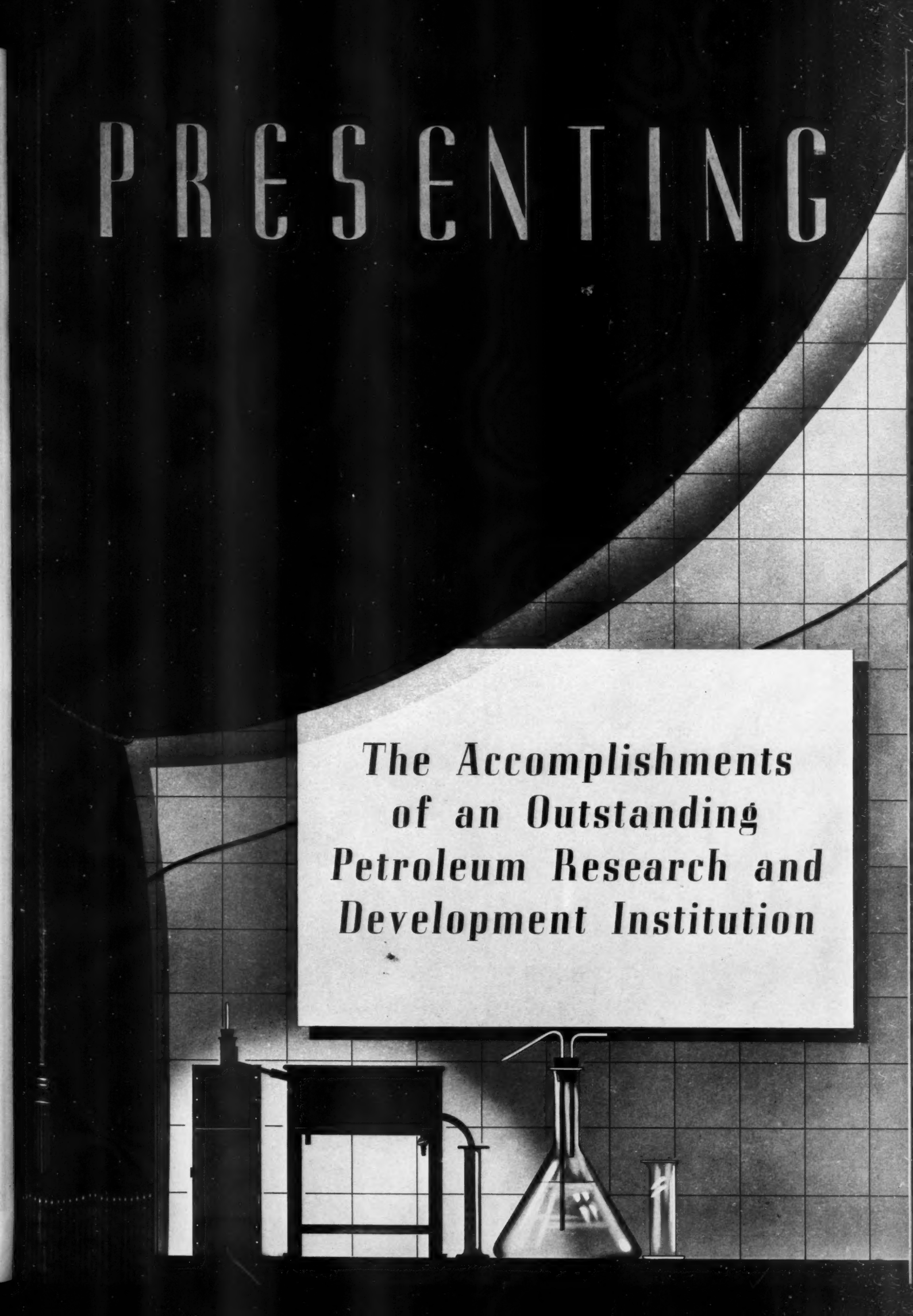
The tower will be used to fractionate cracked gasoline, and is one of several that will be erected at the Anderson-Prichard plant. All improvements are to be completed around June 1. The plant will be strictly modern in every respect, making a large number of specialty products used by the industrial trade, as well as all grades of gasolines, road oils and asphalts.



In the McCamey field of West Texas, Continental Oil Co. operates several large central pumping powers. Thirty-two foot bandwheels are used. The installations are conspicuous for their large size and neat appearance, although they have been in use for several years

PRESENTING

The Accomplishments of an Outstanding Petroleum Research and Development Institution



PROGRESS

Technical progress in petroleum refining is a record of marvelous achievement. The application of science to the manufacture of oil products has become one of the industrial wonders of the world. Yet science tells us that the industry is only at the threshold of a much broader field of utility.

From the refining of crude oil into a few products, based largely on physical separation by simple distillation, processing has become essentially chemical in character. Manufacture by synthesis is necessary in supplying the demand for improved motor fuels at lower costs.

Back of every milestone of progress have been long periods of research. Laboratories often have gone far afield in their search for the fundamental data which later became the basis for the design of working plants. Scientific advancement has been cumulative in its benefits.

What this has meant to the oil business is everywhere apparent. It has resulted in the reduction of waste not only in processing but also in the utilization of products. The automobile has become the finished mechanism we know today because its engine is served with better motor fuels. As a consequence of the efficiency of automotive transportation the manufacture of motor vehicles has become the nucleus of industrial growth.

The contribution of oil technology to general industrial expansion does not stop with the perfection of hundreds of products serving millions. In order to conduct its more intricate manufacturing operations, petroleum refining has become a major market for material and equipment made by other industries thus contributing heavily to the nation's business.

Outstanding in the fields of research and development which have produced these results is the Universal Oil Products Company. It has perfected and made available to refiners the processes developed in its laboratories and in refineries. Devoted to the study of hydrocarbons and their greater utilization, this company has notably accelerated the march of refining progress and furthered the cause of true petroleum conservation.

Hiram Joseph Halle

President of the Universal Oil Products Company

Pioneers IN RESEARCH

The Universal Oil Products Co. is essentially a research institution. It does not manufacture any products. Its business is to develop processes to make more useful the world's hydrocarbon resources, to license those processes to refining companies, big and little, and to make them operate effectively. First to be developed was the cracking process.

Less than two decades ago, cracking was little known. To the extent it was used, its operations were restricted to gas oil. The gasoline yield was 25 to 30 per cent. Cracking runs were measured in hours—two days was the limit. Carbon formation dictated the stock that could be

cracked and limited the length of the run proportionately.

Today cracking can and does convert all kinds of oils into gasoline, yields are as high as 75 per cent and cracking units run continuously for months. Carbon formation has been conquered along with countless other problems that beset the early refiners.

Next, catalytic polymerization was developed. This does with the lightest gaseous fractions of petroleum what the cracking process does for the heaviest liquid fractions—converts them into a superior gasoline for modern engines.

These two processes are the high spots. They point the way to what is coming. They are of fundamental importance. They have revolutionized the refining industry. One barrel of crude now does what 2 bbls. did previously. We are now entering a stage in which indications are that 1 bbl. will soon be doing the work that formerly required three of the same quality.

In order to measure the value of these achievements let us glance at the oil and motor picture as it looked to refiners in 1920. There were 9,000,000 automobiles in the United States on the road then and 115,000,000 bbls. of gasoline were produced in 1920 to fuel them. This took 433,915,000 bbls. of crude oil. Of the total gasoline produced, 15,000,000 bbls. were cracked gasoline.

In 1936 there were 28,000,000 cars on the road. Five hundred and fifteen million barrels of gasoline were produced and 1,068,000,000 bbls. of crude were refined. More than half the gasoline produced was cracked gasoline (239,000,000 bbls.). Of the remainder, 231,000,000 bbls. were straight-run gasoline and 42,000,000 bbls. natural gasoline, produced from casinghead gas.

The story of Universal is the history of refining development from that day nearly 20 years ago when it showed the world how to convert heavy oil into gasoline—heavy crudes, residual fuel oils, all those stocks which have a high content of carbon-forming substances.

Let us take a look at the average refinery of 1920 and see how the refiner operated it.

First, the lightest fractions of the crude were distilled off—result, gasoline. The average yield was about 26 per cent. The demand was expanding rapidly.

Second, the kerosene cut was taken off—8 to 12 per cent. Kerosene generally could be depended on to pay its own way and more.

Third, the gas oil cut was removed, 8 to 12 per cent. Gas oil found a good market for the enrichment of illuminating gas.

Fourth (in lubricating oil plants) the lube stocks were distilled off. There were profits in lubricating oils but they were made by comparatively few companies.

The remainder of the crude was fuel oil, to be sold as such or to be reduced to asphalt or coke. Fuel oil, which amounted to about half the crude, had to be sold in competition with cheap coal. That meant the refiner must sell it below, usually far below, the price he had to pay for his crude.

The result was a big hole in his earnings which had to be plugged with profits from his other products, if any. Thus the result of refining operations was to increase the value of about half the crude and degrade the value of the other half below the cost of the raw material.

FUEL OIL MARKET

There were many times and many places when and where fuel oil could not be sold at all. Then it backed up in the refinery, filling the storage tanks, choking operations and cutting down the production of gasoline—spot cash.

As a partial way out, refiners, when they could get it, bought special light crude which contained a large percentage of gasoline and proportionately less fuel oil. This helped some, but it put a premium on high gasoline crudes which continues in part today, despite the revolutionary changes that have come about in the refining picture.

That was the situation when the cracking process came along. The process at first didn't do much to help in so far as the industry in general was concerned. It could crack gas oil which was scarce and high but not fuel oil which was plentiful—too plentiful—and cheap.

Economics demanded the cracking of fuel oil but how could it be done? Residual oils such as fuel oil contain a large percentage of substances that quickly coke when they contact the hot walls in cracking tubes and chambers. This coking could not be prevented by any method then known.

As coke formed on the inner walls of the tubes and chambers it insulated them so the heat could not get through into the oil to break down the molecules. Hot spots developed, tubes melted and split.

Cracking gas oil gave trouble enough. Being a distillate, it contained less carbon-forming constituents than residual oil but even so, carbon formed in sufficiently large quantities to hold down the duration of cracking runs to not more than two days, although the yield of gasoline was only from 30 to 35 per cent. Time out for frequent cleaning of the units reduced the efficiency and increased the cost.

Even if all the gas oil had been cracked there would not have been enough to supply the needed gasoline. To refiners of that period a prediction that some day it would be possible to crack residual fuel oil without these difficulties and dangers, in a continuous operation, would have seemed a wild dream at best.

After the nuisance and the menace of carbon had been finally conquered by the process made possible through an epoch-making invention, and when fuel oil was really being converted into gasoline in long, nonstop runs, many refiners could not and would not believe it.

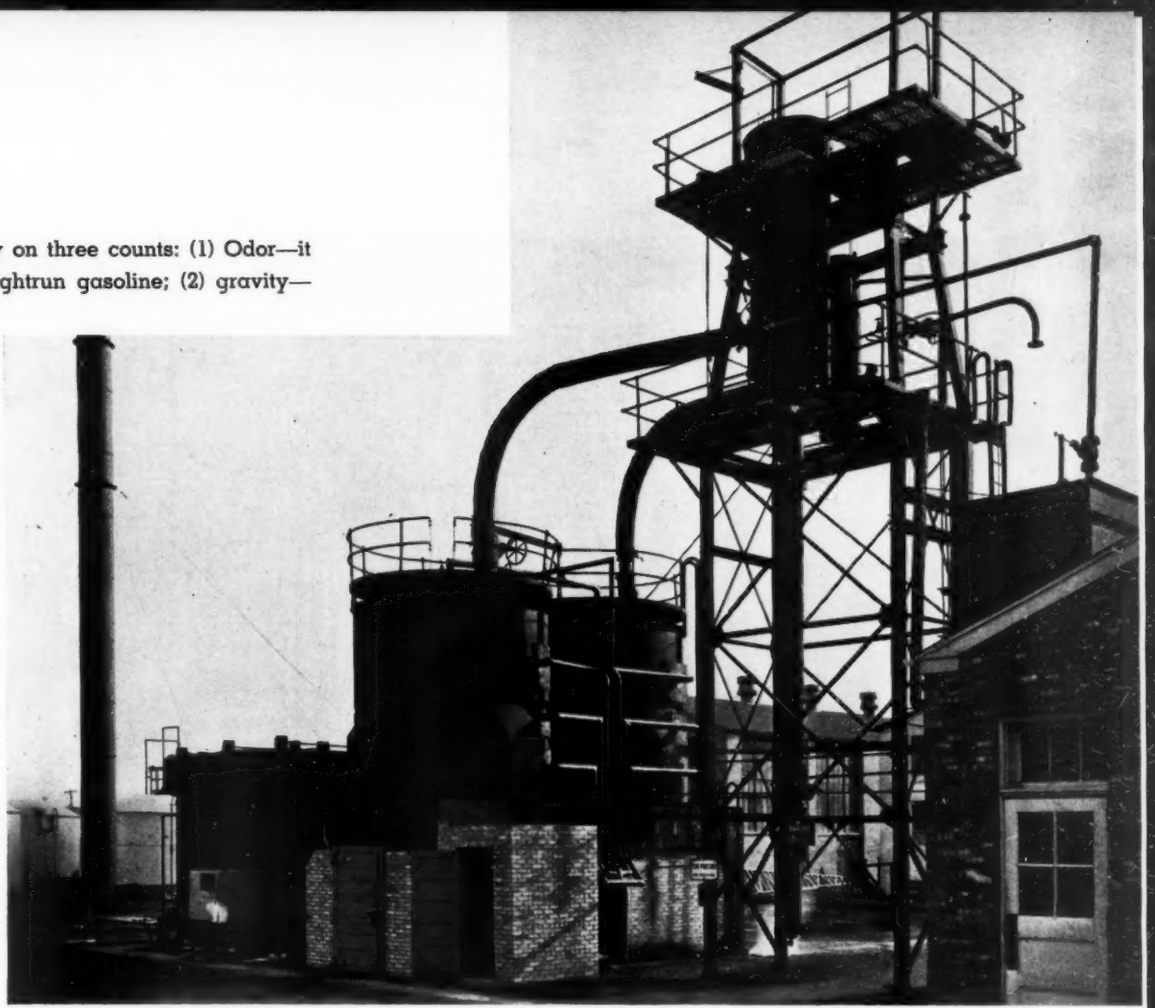
THE LIBRARY IN THE RIVERSIDE LABORATORY

The most farsighted refiner in 1917, could hardly have imagined that his refinery, sprawling over perhaps 100 acres, would some day be embraced in a single combined skimming and cracking unit, occupying but a few hundred square feet of ground and doing more work and better work than his scattered scores of fire stills and steam stills and agitators could ever do. He would not have believed that crude oil would be pumped into this unit to be stripped of its straightrun gasoline with waste heat in a distillation section; that the remainder would then go into the cracking section and that even the straightrun gasoline would be returned to the unit for a reforming operation to bring its quality up to higher market standards.

Those things were to come and have come. But they had to wait for the patient work of research men to solve one by one, the problems and technical difficulties that confronted them at every step. Now in retrospect, with the problems solved, they may appear to have been simple and easy. Despite all that has been accomplished, the oil industry is now on the verge of still greater achievements.

Commercial cracking began in 1913 but it didn't make much of a stir in the refining world for a long time. The potential value of cracking was not fully recognized. The need for it was hardly imagined except by a few farsighted companies and even they did not sense the full significance it was destined to have for the industry and the world. Most oil refiners criticized cracking instead of welcoming it. They indicted cracked

THE THREE ORIGINAL BUILDINGS OF UNIVERSAL LABORATORIES.
THE ATMOSPHERE HERE IS THAT OF A QUIET COLLEGE CAMPUS



"OLD FAITHFUL" DUBBS NO. 2. ON THIS UNIT, WITH A CAPACITY OF 250 BARRELS A DAY, WERE WORKED OUT MANY FEATURES OF UNIVERSAL'S CRACKING PROCESS

gasoline and found it guilty on three counts: (1) Odor—it smelled different from straightrun gasoline; (2) gravity—its gravity was low compared with that of straightrun gasoline; (3) color stability — it was slightly yellowish.

These properties upset the existing standards upon which gasoline was then being marketed. Gasoline had to be "sweet" according to those standards. Gasoline was sold on a gravity basis (the higher gravity the better), although it was later proved that gravity had nothing to do with quality. And gasoline had to be water white according to the prevailing notions of the day, although color is no index of quality. It is an interesting fact that the same men who developed the process to crack residual oils and all other kinds of oils, later led in the educational campaigns that finally dispelled many of the fallacies about cracked gasoline quality which restricted its sale and imposed needless and wasteful refining costs upon the industry. These educational campaigns are still carried on and have given cracked products their rightful place.

It is also interesting that in their eagerness to criticize the new product, the refiners totally overlooked its outstanding advantages as a superior motor fuel and later ignored them when they did know. In fact, the points they attacked most severely are the very points that constitute its now admitted superiority.

"Get rid of unsaturates," was one of the chief aims in treating gasoline at that time, ignoring the fact that the unsaturates carry the antiknock value.

DOUBTED VALUE

But the refiners were not alone in looking askance at cracking and its product. Many petroleum technologists joined them in that attitude. Many honestly doubted that cracking would ever amount to much as a factor in the refining industry or that motorists, of which there was a steadily growing army, would ever accept the new gasoline as a suitable motor fuel.

Some of the doubters put their views on record and they make amusing reading today, although it looked for a while as if they might be right. The prejudices of the experts spread among the laymen too. Motorists, if they thought of the matter at all, looked at cracked gasoline with suspicion, because some of the refining companies that made only straightrun gasoline bragged about it and bought newspaper space to warn the public against the perils of cracked gasoline as a good motor fuel.

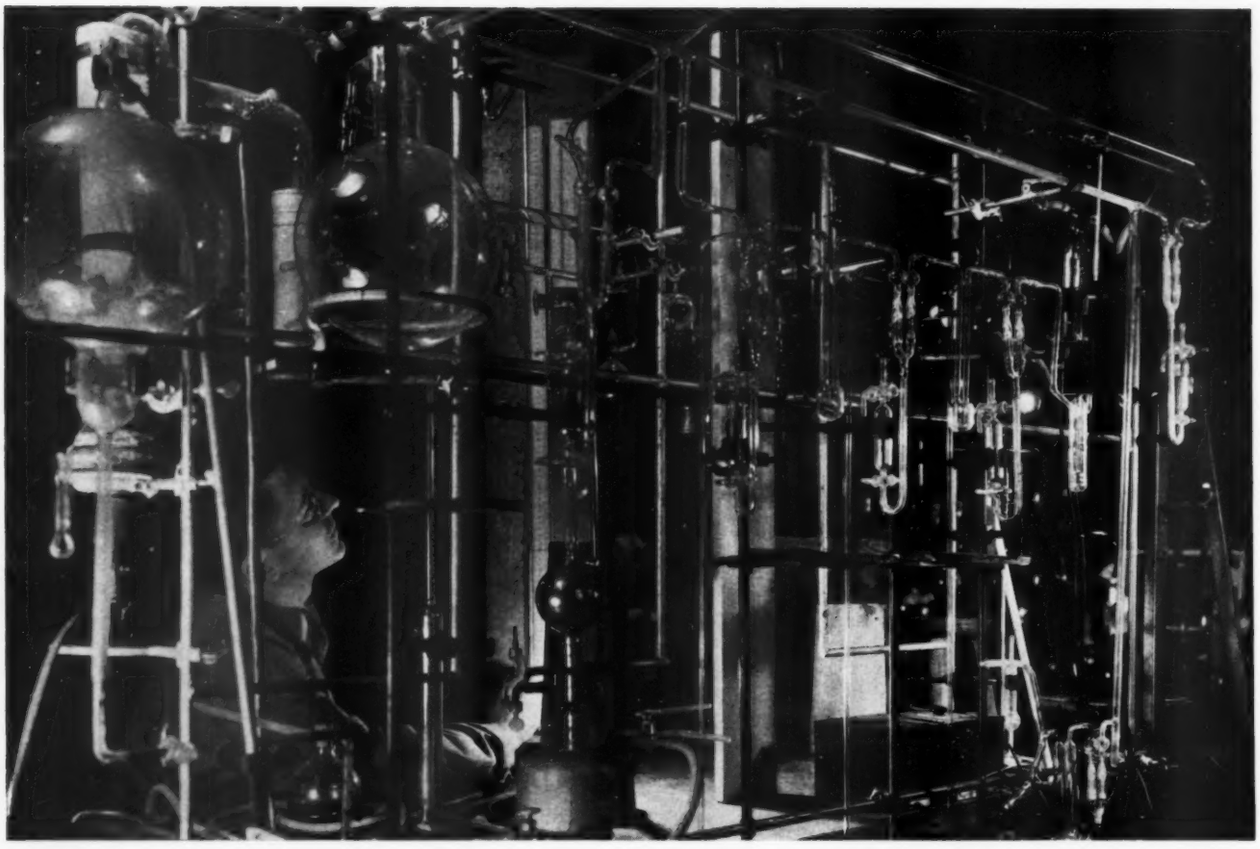
To the Standard Oil Co. (Indiana) goes the credit for first commercializing the gas oil cracking process. Dr. William M. Burton, the inventor, was a distinguished chemist, one of the first to be brought into the industry. His achievement received recognition when he was made president of the Standard of Indiana and later when he was awarded the Perkin medal by the American Chemical Society.

LIMITED CRACKING

For the first seven years cracking was developed intensively but not extensively. The Burton process and its immediate substitute, the Burton-Clark, were the only cracking processes in commercial use, although there were a number of experimenters in the field. They were closely held. Their use was confined to the Standard of Indiana and a few affiliated companies to which the Indiana company limited licenses with restrictions on sale of products.

Many of the problems which early beset the cracking process were solved during those seven years. Ingenious plans and designs for cracking still batteries were then perfected. Hundreds of Burton and Burton-Clark stills were built in the plants of the licensees.

A whole new refining technique was being built up but the early basic limitation on cracking still prevailed. Carbon was still accepted as determining what stocks might be



HEAVY GLASS APPARATUS FOR OBTAINING EXTREMELY HIGH VACUUM. SOME WORK IS CARRIED OUT UTILIZING A FRACTION OF A MILLIMETER OF WORKING PRESSURE

cracked and the length of the runs. But there was a group at work on the problem that did not accept that view. Their efforts were bent to free the industry completely and forever from the carbon racketeer, not to temporize with it. Later developments show how successful they were in accomplishing this objective.

For a long time the refining industry in general knew very little about what was going on in cracking development. The Burton licensees carefully guarded the information they developed and the advantages it gave them. The consequence of this restricted policy and this restricted usefulness was that in 1920, seven years after the first Burton stills were in regular operation, only 15,000,000 bbls. of cracked gasoline were produced out of the total of 115,000,000 bbls .of gasoline made. One barrel of cracked gasoline was produced to every 8 bbls. of straightrun. This was despite the fact that the peak demand for gasoline which had been caused by war activities gave every incentive to refiners to increase gasoline production to the greatest possible extent.

NEW PROCESS

But this disparity was not to last long. In the previous year—1919—Universal had demonstrated a new way of cracking and the leaven of a new idea was working in the refining industry.

The new process had been built up from a discovery made several years before. The discoverer was Jesse A. Dubbs, a pioneer oil refiner with imagination and an inventive mind. Mr. Dubbs, who was brought up in Pittsburgh and who migrated to California to go into the refining business, filed a patent application November 20, 1909, on a continuous process which involved oil distillation and condensation under pressure. The patent was issued to him on January 5, 1915. It was Patent No. 1,123,502 and its title was "Treating Oil."

WANTED WATER REMOVED

The process, on which the patent was asked, made cracked gasoline or pressure distillate but that was incidental to the main purpose of the inventor, and he did not specifically refer to cracking in the claims. The demand for gasoline was not so keen in 1909, particularly in California, where almost all the crude produced was used for fuel in its natural state or was run down to asphalt.

Here is the story:

At the time the invention was made, Mr. Dubbs was the owner of the Sunset Oil & Refining Co. and the Globe Asphalt Co. of Obispo, Calif., which company manufactured asphalt and other refined products.

In 1907, the Santa Maria field which had been recently brought in, developed water. The oil and water came from the wells in such a stable emulsion they could not be separated by simple heating in a pipe still, as had been done

with other emulsified crudes. The oil was almost worthless and wholly unsalable because of its high water content.

Mr. Dubbs attacked the problem and solved it. In 1909, the first "Dubbs emulsion plant" was installed on the Rice Ranch Oil Co.'s lease in the Santa Maria field. It operated with the still and condenser under pressure built up by its own generated vapors, whereas all previous dehydrating plants had operated at atmospheric pressure. Heating under pressure did the trick and Mr. Dubbs filed his application for patent.

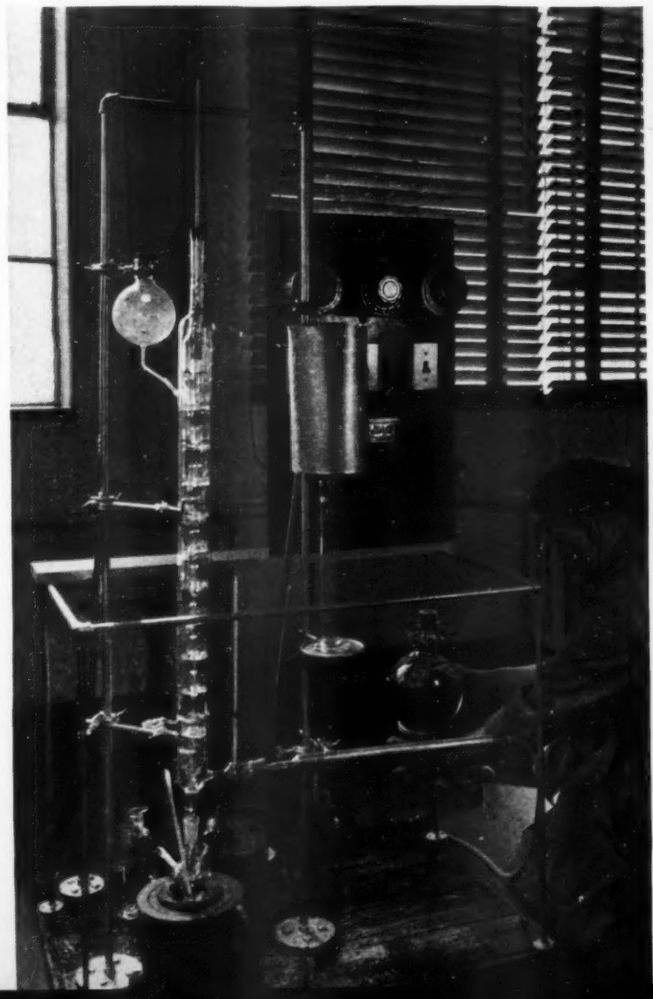
The light ends driven off in his dehydrating process were of a different kind than those obtained in dehydrating at atmospheric pressure—or refining at atmospheric pressure. They were cracked gasoline-like vapors. For several years, the Dubbs dehydration process was used in California. It was an important invention in itself.

THE MASTER GLASSBLOWER. WITH TWO ASSISTANTS HE MAKES ALL THE SPECIAL GLASS APPARATUS USED IN THE RIVERSIDE LABORATORIES

When the Burton patent was issued in 1913 it drew widespread publicity. The automobile industry was advancing with giant strides. The need for more and more gasoline was beginning to be recognized as it had not been in 1909.

Inventor Dubbs then realized the importance of what he had discovered when his dehydration plant, heating and condensing oil under pressure, produced a gasoline-like liquid.

He knew that he had been cracking. He realized also that this discovery far surpassed the dehydration invention in importance. Whereas the dehydration process, important as it was, could apply only to a few fields in a limited way, the cracking invention was destined to remake an industry the world over. In order to protect inventors in just such cases, the law grants to an inventor the rights to all the benefits and uses of his invention, whether he knew them at the time or not.



FRACTIONAL DISTILLATION APPARATUS DESIGNED FOR MOST EXACTING CONTROL

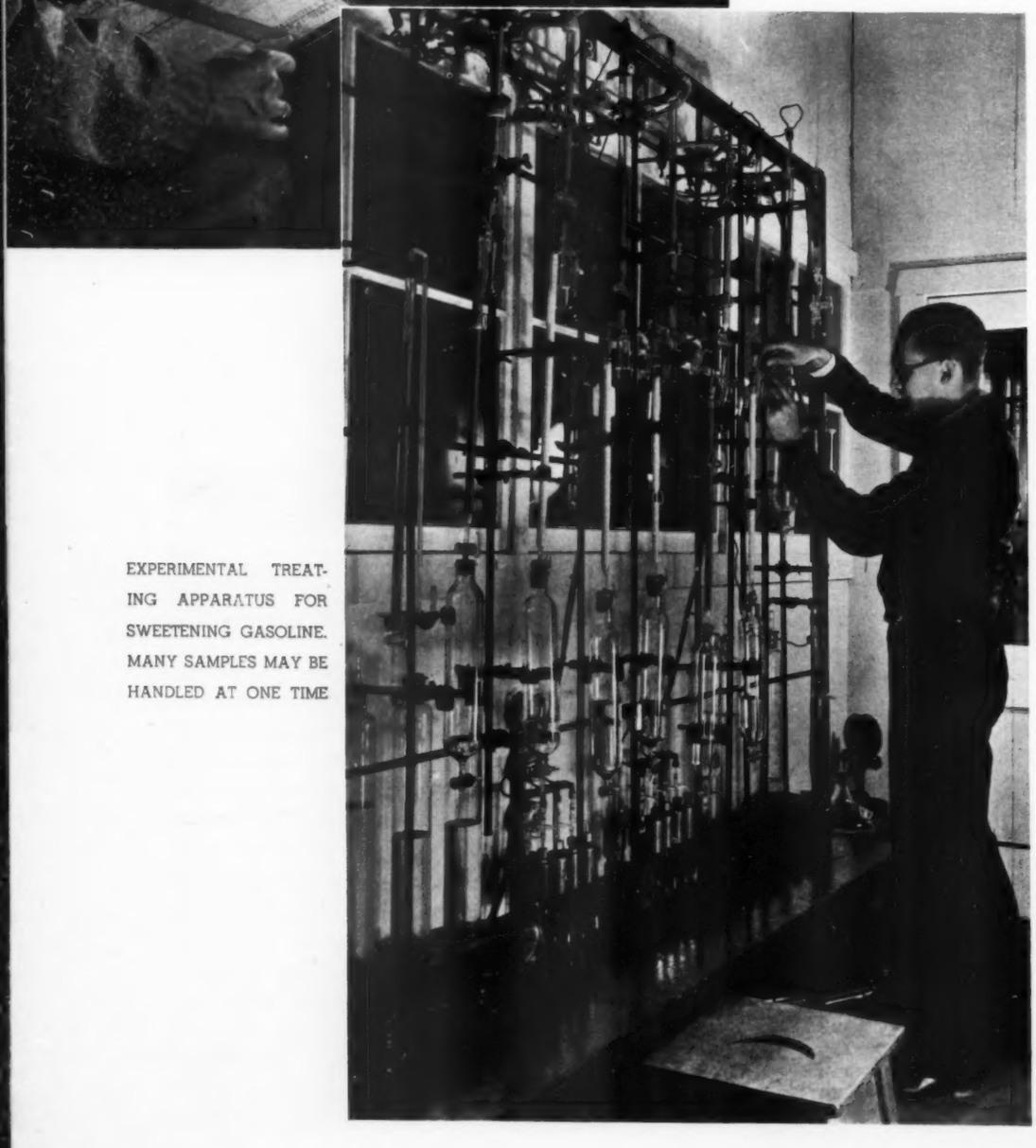
Acting under this provision, Mr. Dubbs amended his application and asserted claims to cover distillation, inclusive of cracking and condensation under the pressure of the self-generated vapors to which he was entitled. The patent issued included these claims. This patent was acquired by a group of men who were also interested in Universal.

A laboratory was established at Independence, Kans., and a group of research men, with the Dubbs invention

VACUUM DISTILLATION APPARATUS USED WHEN EXPLORING THE QUALITIES OF THE HEAVIER FRACTIONS OF CRUDE

as a starting point, went to work to develop this cracking process that should be as universal in scope and flexibility as it is in name. This group included C. P. Dubbs, who as an inventor was even more gifted than his father, the original inventor, and who had carried on independent research of his own in a laboratory at Wilmette, Ill. The immediate result of the work done at Independence was the building of a cracking unit which demonstrated the possibilities of the process. The ultimate result was of incalculable importance to this and all other countries.

An event occurred there in the summer of 1919 which was destined to change radically the whole refining picture and to bring in a new era of development both in oil and in motors. That event was the private demonstration of the Dubbs cracking process to a selected group of refiners at their request.

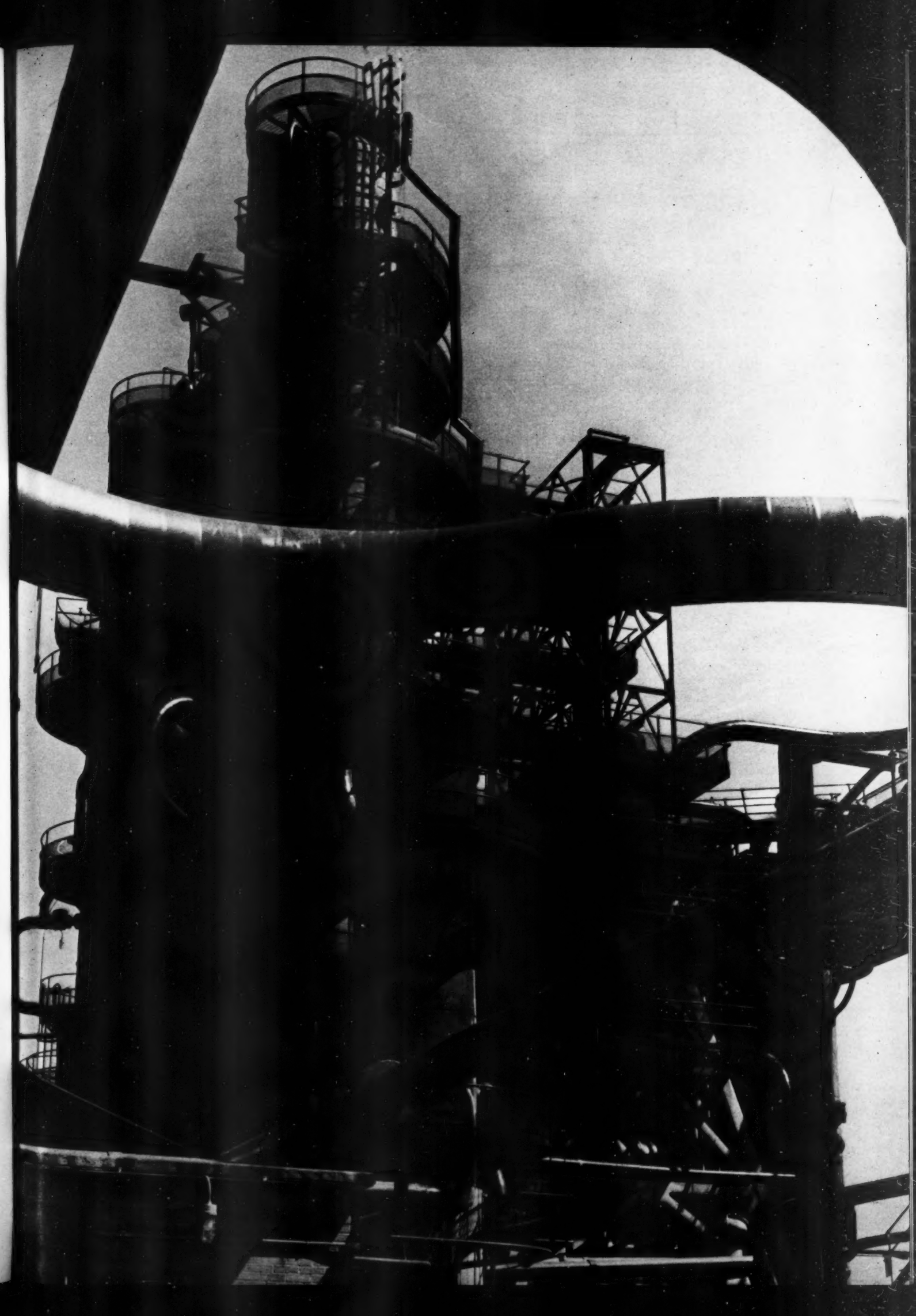


EXPERIMENTAL TREATING APPARATUS FOR SWEETENING GASOLINE. MANY SAMPLES MAY BE HANDLED AT ONE TIME

The scene of the test was a 2-acre field surrounded by a high board fence. There were 21 men in the group, representing 14 refineries. Certain of them represented the Western Petroleum Refiners Association, others the National Petroleum Association, which latter is made up of refiners of Pennsylvania Grade crude.

In fact, the demonstration had been arranged primarily at the request of Judge C. D. Chamberlin, then the beloved general counsel of the National Petroleum Association, who had heard of the new process and wanted his members to know what possibilities it might hold for them. He suggested the names of the men to represent the National Petroleum Association.

Some of the witnesses of that demonstration run are active and successful oil men today; some have sought other fields; others have passed on. Some of the companies that were represented there are still doing business under the same name and with the same organization. Others have been reorganized, have vanished from the scene altogether or have been merged



THOUSANDS OF MOTOR FUEL TESTS ARE MADE ANNUALLY. IN THE FOREGROUND IS A C. F. R. ANTIKNOCK TEST ENGINE AND IN THE BACKGROUND IS ONE USED TO TEST BY THE ARMY AIR CORPS METHOD

in other organizations. On the morning of July 19, 1919, the group assembled according to schedule in the Booth Hotel in Independence. There they met H. J. Halle, then as now president of Universal. Most of them met him then for the first time.

The demonstration unit had been fired up and brought on stream. Everything was in readiness for the momentous event. Gas oil was to be the charging stock, as it was then the recognized and most available stock for cracking. In fact most refiners firmly believed it was the only oil that could or should be cracked.

The visitors were asked how long the run should continue in order to give results that they would consider conclusive. After discussion they decided upon 10 days. Mr. Halle agreed to this and stated his conditions.

FULL INSPECTION

First, he asked that the group be represented during the entire course of the test, day and night, and that all observers in person be present at the termination of the run to inspect the unit after it was shut down.

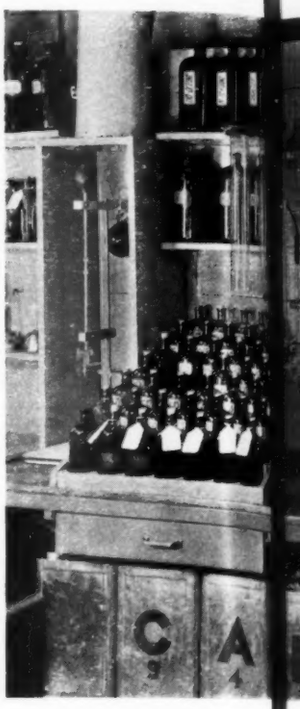
All were invited to watch every detail of the run, to trace and examine every line to and through and from the plant. Samples of the charging stock and of the products were furnished to all for inspection and testing.

What did that first commercial Dubbs cracking unit look like, how was it constructed?

It is best described in the report of the demonstration which was written later by a committee of the witnesses as follows:

"The construction in the main consisted of ten 4-inch tubes of extra heavy wrought iron pipe, 20 feet long, placed horizontally in a combustion chamber, with six tubes in the lower and four tubes in the upper row, connected by return bends and so constructed that a short portion of each pipe, and the bends, are outside of the furnace chamber proper, to enable internal inspection, cleaning or repairing tubes when necessary. The fuel used in the furnace is natural gas."

The reaction section which then, as now, was an important feature of the process, consisted of four insulated 10-inch tubes, connected and placed horizontally on top of the furnace, outside the heated zone. The condenser was an aerial "harp" exposed to variations of temperature, sun and wind.



The unit had a charging capacity of about 80 bbls. per day. The run went through exactly as planned.

Just at noon on July 29, the unit was shut down, having completed a 10-day run. The fires were drawn and the unit was allowed to cool. Then it was opened and inspected by all present.

The tubes were free from coke—the run could have gone on indefinitely.

This was the first official demonstration of clean circulation—the curse of coking in the tubes had for the first time been lifted from cracking operations — it seemed incredible but they had seen it with their own eyes. Whether they sensed it then or not they had seen a new chapter written into refining history.

That night the group again assembled in the Booth Hotel for a conference. There was no need to ask what the process could do—they had watched the unit prove that. How could they get it in their own plants, what were the terms and conditions? These were the questions they put to Mr. Halle. In reply he laid down the policy which has been followed ever since. This policy embraced two points.

GUARANTEES

First, guarantee of the performance of the unit as to capacity and yield, with a provision which covered reimbursement of its cost to the refiner and removal of the unit from his plant if it failed to meet the guarantees.

Second, unqualified guarantee to every licensee of immunity against the world from all charges of patent infringement. This includes not merely defense of litigation but also full protection against all loss through damages that might be assessed.

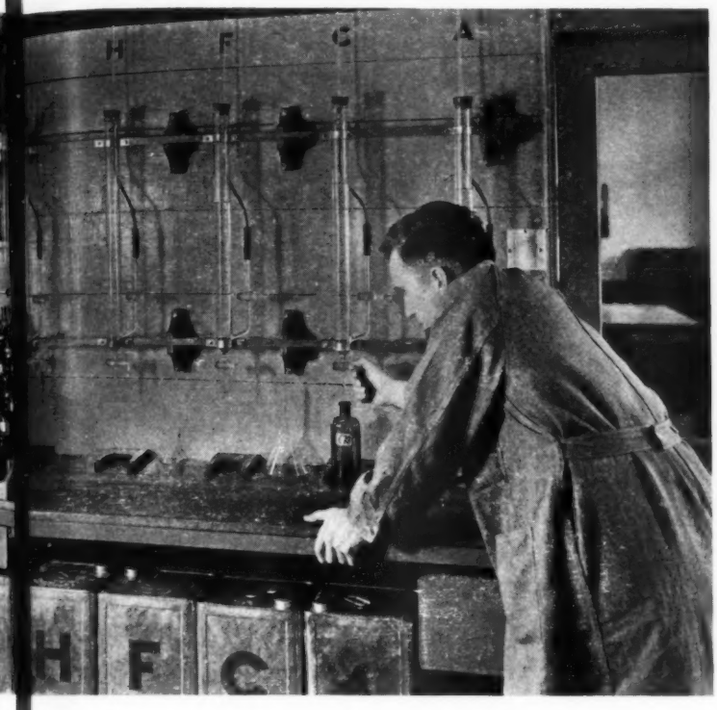
Never before had such guarantees been embodied in any contract in the oil industry or any other industry, so far as anyone present at that conference had heard.

Thus was Universal's ship launched. It has grown into a mighty fleet that sails the seven seas and finds a welcome in every port where oil is to be converted into a motor fuel.

After the conference, the members of the two associations represented appointed

DIESEL FUEL TESTING IS ALMOST AS IMPORTANT AS MOTOR FUEL. HERE IS APPARATUS USED TO DETERMINE THE KNOCKING CHARACTERISTICS OF ALL TYPES OF DIESEL MOTOR FUEL

committees to write reports of their observations of the run and its results. One report was presented at the semiannual meeting of the National Petroleum Association held in At-



BURETTES FOR MEASURING STANDARD REFERENCE FUELS IN THE ANTIKNOCK TESTING LABORATORY

lantic City in September, 1919. This was the report from which the description of the demonstration unit is quoted. Both reports were published, one in the National Petroleum News and the other in The Oil and Gas Journal.

Mr. Halle and Dr. Gustav Egloff were present by invitation at the Atlantic City meeting when the report was presented. Mr. Halle was requested to address the meeting, considerable questioning and discussion followed.

The late George R. Canfield, founder and president of the Canfield Oil Co. of Cleveland, a veteran refiner, asked Mr. Halle if it were true the Dubbs process could crack oil without clogging the tubes with coke in the heated zone.

"It not only can be done—it is being done," responded Mr. Halle.

Mr. Canfield replied bluntly he could not believe it.

"I have spent more than $100,000 in the effort to accomplish that result," declared Mr. Canfield, "and I have failed to accomplish it, and I know many others who have likewise tried and failed."

Others present beside this veteran Pennsylvania refiner were skeptical. They had to be shown, to see it with their own eyes. Now they have seen it from one end of the world to the other.

It was estimated at that time that well over $100,000,000 had been spent by various oil companies, individuals and groups in attempts to solve the riddle of cracking oil continuously without carbon forming to choke the tubes and stop the operation—all had failed.

The story of that run at Independence, its duration (10 days) and its unheard-of results was the sensation of the industry—a sensation that could not be disregarded. Every refiner was thinking and talking about this demonstration but it was months before much was done to take advantage of it.

But the campaign of research and development went on, financed by the money that J. Ogden Armour, with unwavering faith in Mr. Halle, continued to pour into the development of the process. More than $6,000,000 was spent before a dollar of revenue was available.

ARMOUR HOLDINGS

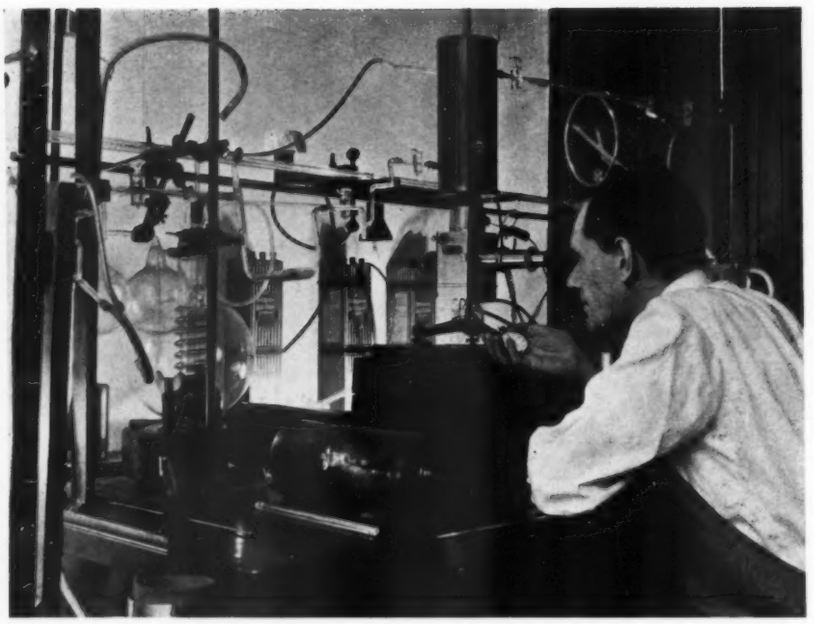
How well the faith of Mr. Armour was justified was proved in 1931 when, after more than 10 years of active operations spread throughout the world, Universal's 1,000 shares of stock were sold for a round $25,000,000, restoring the fortunes of his widow and enriching the men whose efforts had made the process a success.

And where did the first available money go?

Not into the pockets of the stockholders but into a fund to finance pure research in petroleum for the good of the industry and the world, and without possibility of profit to the company.

In January, 1926, Mr. Halle, in behalf of Universal, pledged to the American Petroleum Institute a quarter million dollars to be devoted to this purpose without restrictions.

PRECISION FRACTIONAL OIL DISTILLATION UNIT



THE EFFECTIVENESS OF CATALYSTS MAY BE DETERMINED ON THIS SPECIALLY DEVELOPED ELECTRICAL APPARATUS. RADIO-ACTIVITY IS THE BASIS FOR THE TESTS

The gift was announced in a letter to the directors of the institute, then in convention in Los Angeles. The letter speaks for itself:

Chicago, January 12, 1926

To the Officers and Directors,
American Petroleum Institute.

Dear Sirs:

For the purpose of furthering and enlarging the plans and work to be done in scientific research in petroleum, initiated by the fund of $250,000 recently pledged to the Institute by Mr. John D. Rockefeller, as defined by him in his recent letter to you, we are pleased to hereby add our subscription and pledge for a like amount, namely $250,000, to be available over a like period of five years, beginning with 1926, at the rate of $50,000 per year, as may be required and called for.

We have had plans in preparation for the establishment of scholarships in universities and colleges in the United States and foreign countries for the study and development of the pure science of this important subject. We now feel that concentration of this work under one directing body, and for the free use of the industry, is likely to more quickly advance and more efficiently accomplish the desired results.

Without imposing any restrictions or conditions, other than that the fund shall be used by the American Petroleum Institute for scientific purposes as herein specified, we now gladly subscribe the amount herein named, with the express hope that the plan shall be world-wide in scope and its purpose primarily, if not wholly, the search for and development, in a broad sense, of scientific truth underlying and relating to the subject of petroleum, and all for the knowledge, benefit and free use of all people interested in, associated with, or to be benefited thereby.

Respectfully,
UNIVERSAL OIL PRODUCTS CO.
By H. J. HALLE, President.

The money was duly paid over at the rate of $50,000 a year for five years. In addition to this donation, plans mentioned in Mr. Halle's letter have also been carried out. Scholarships and lecture courses in various universities have been and are being main-

ONE OF THE OLD SOLDIERS AT RIVERSIDE. THIS PLANT WAS BUILT AT A COST OF $90,000 TO SETTLE A MOOT POINT. RAN A FEW DAYS, FURNISHED THE NEEDED INFORMATION AND WAS SHUT DOWN, NEVER TO RUN AGAIN

TIGHTENING THE HEAD ON A HIGH-PRESSURE BOMB. IN THE BACKGROUND ARE ARMOR-PLATE STALLS WHERE HIGH-PRESSURE REACTIONS ARE CARRIED OUT. RUNS HAVE BEEN MADE UNDER PRESSURE AS HIGH AS 15,000 POUNDS PER SQUARE INCH

tained by the company.

It was due to the imagination and courage, coupled with good judgment, of the Shell interests, that the first licensed commercial Dubbs unit was installed in the refinery of the Roxana Petroleum Corp. (now Shell) at Wood River, Ill.

It was completed and started in operation in March, 1921. The charging capacity of the unit was 200 bbls. a day but the effect it was destined to have on the refining industry was out of all proportion to its size. Besides the practical success of the unit, three basic policies brought this cracking process at once to the very center of the stage.

First—The process made it possible for the first time to crack successfully heavy residual fuel oil, through discovery of the clean circulation principle. Previous cracking operations had to be confined to a selected gas oil because of inability to get away from coking troubles; Carbon P. Dubbs' inventions, developed by Universal, solved that problem.

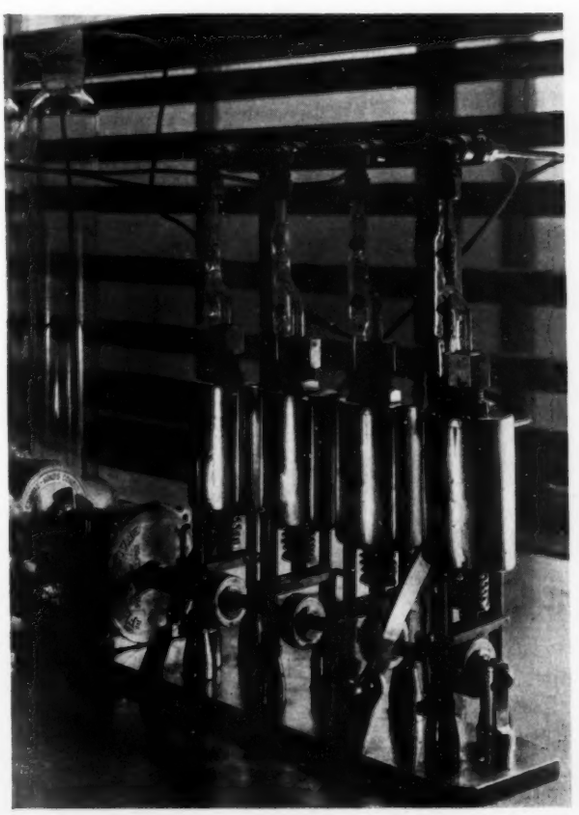
Second—The process for the first time put effective cracking within the reach of all refiners, big and little, without discrimination, on uniform terms that permitted them to make good profits—in many cases big profits.

Third—Cracking for the first time was brought out in the open. Knowledge of the cracking art that had been discovered in the development of the process was made available to the whole industry, as well as the further information that was constantly being accumulated as development of the process went forward.

Surely, this cracking process was brought to refiners at a timely moment. Automobiles were rolling off the assembly lines by hundreds of thousands. Everybody wanted a car and everybody who could, bought one. Roads were being improved, long distance travelers were deserting the railroads and traction lines for the highway, delighted to be masters of their own transportation. Buses were hauling more passengers and motor trucks more freight. Refiners were hard put to supply the rocketing demand for gasoline and haunted by the fear they could not keep pace with it. Universal's Dubbs cracking process, by doubling the yield of gasoline from crude, was the main factor in banishing that fear.

In the early twenties another problem loomed up and for the first time it was recognized as the refiners' problem. This was the knock in automobile engines. It was not new—automobiles had always knocked, especially when the engine was laboring on bad roads or climbing hills, but nobody had done anything about it because the real cause was not known.

Knocking was attributed to piston slap, to carbon in the cylinders, to faults of mechanical design. It came to be accepted as a necessary evil, as coke had been in the earlier days of cracking. But the automobile engi-



MINIATURE PUMPS WHICH ACCURATELY FEED LIQUIDS INTO APPARATUS AT RATES FROM A COUPLE OF DROPS TO A TABLESPOONFUL PER MINUTE

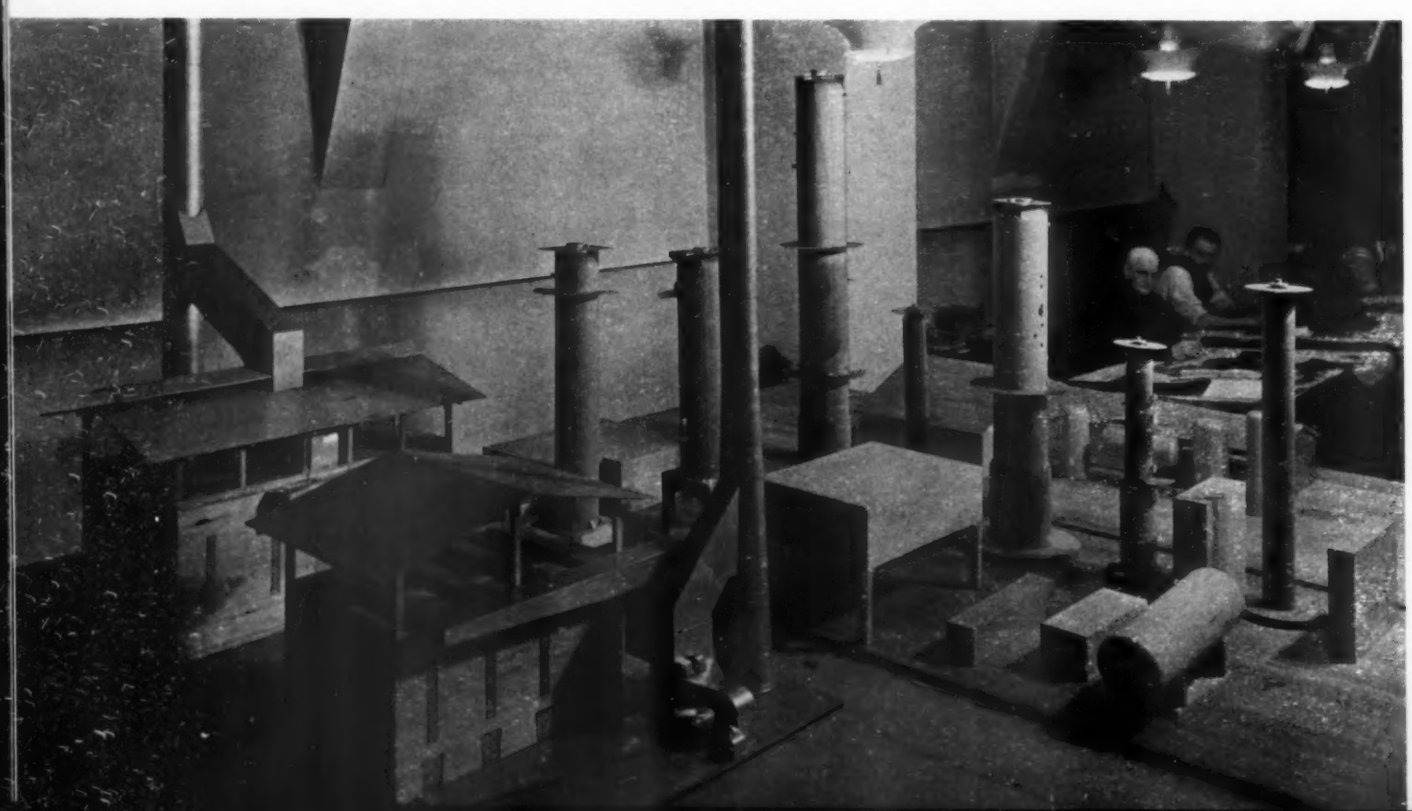
MAIN DRAFTING ROOM IN THE CHICAGO OFFICES. THE COMPANY EMPLOYS 200 DRAFTSMEN. PLANS FOR $25,000,000 WORTH OF CRACKING UNITS, ARE THUMBTACKED TO THESE DRAWING BOARDS, TOGETHER WITH PLANS FOR A DOZEN POLYMERIZATION AND ISO-OCTANE UNITS

neers were not satisfied to accept any of the theories advanced or to accept the knock as a necessary evil. They finally traced it to its true cause, the gasoline. That put it up to the refiners. Straightrun gasoline "preignited," it burned too fast in the engine.

When the cause was found the remedy was at hand.

Cracked gasoline proved to be a knockless fuel in engines of proper compression. Automobile manufacturers redesigned their engines to take full advantage of the cracked fuel. Result, engines of higher power than ever before and today no motorist need suffer the annoyance of knocking. Premium prices for cracked gasoline then be-

EVERY MAJOR DEVELOPMENT IN EQUIPMENT IS MODELED IN WOOD TO DETERMINE OPTIMUM LOCATION FOR EACH UNIT. HERE IS SHOWN A MODERN CRACKING PLANT INCLUDING AN EQUIFLUX FURNACE ON THE LEFT



came general. Veteran refiners still remember that early Universal licensees sold at a premium all the gasoline their cracking units could turn out, some as high as 5 cents a gallon above the prevailing market price for ordinary gasoline.

The trade, in fact, was quick to grant general recognition to the superiority of cracked gasoline as soon as its antiknock value was understood.

In November and December, 1925, The Oil and Gas Journal published a number of articles by disinterested authorities, including professors of chemistry in universities, and government technologists, certifying for the first time to the fact that cracked gasoline was better than straightrun.

FIRST PUBLICITY

These articles were reprinted early in 1926 in a now historic booklet, entitled "Now the Truth About Cracked Gasoline Can Be Told."

Had it not been for the appearance at the right time of a cracking process, omnivorous in its cracking appetite and capable of converting all kinds of oil into antiknock gasoline, it is hard to imagine what the refinery picture would look like today.

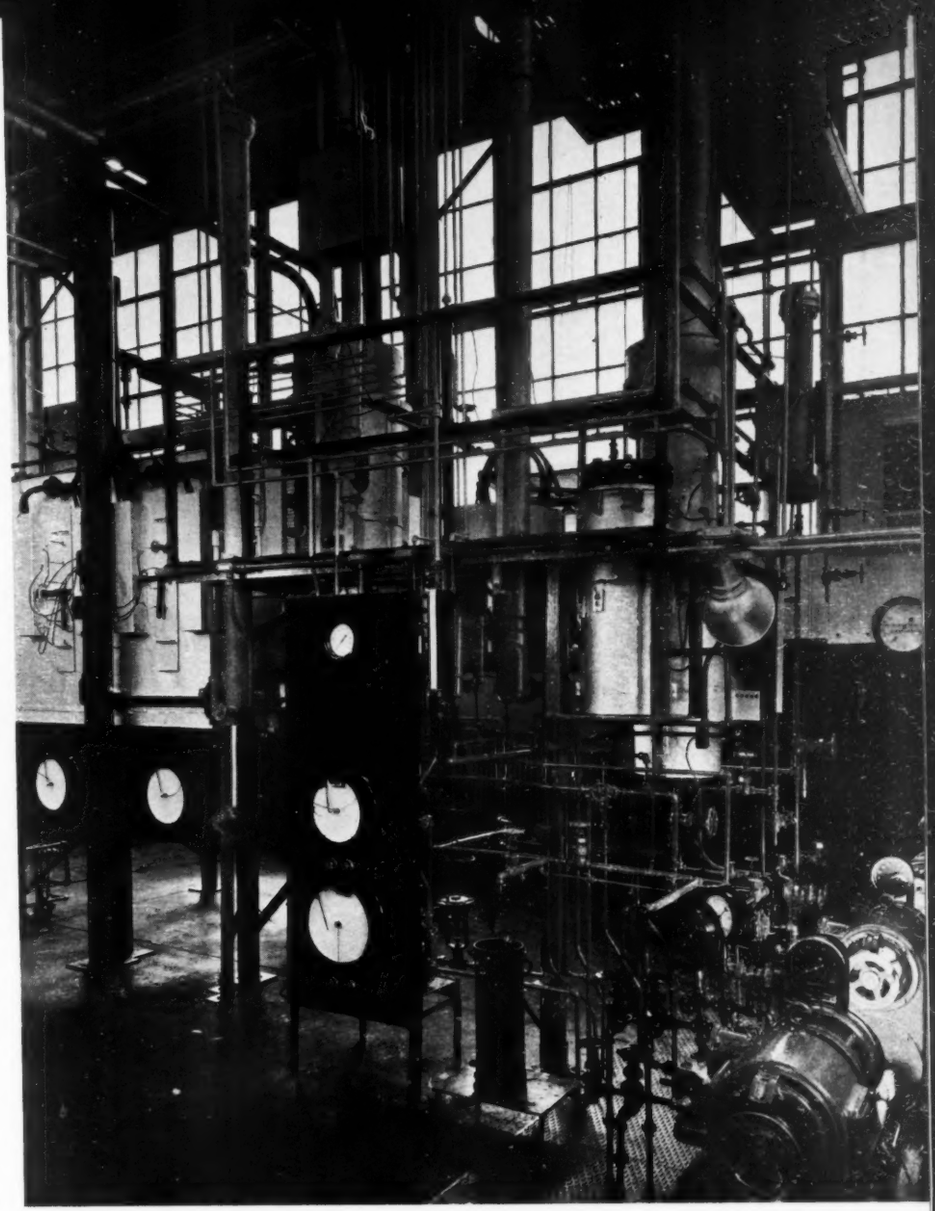
Universal's Dubbs clean circulation operation, by making it possible to crack heavy fuel oil, multiplied by four the amount of cracking stock available to refiners. The yield of gas oil which formerly had been the only suitable cracking stock, was about 8 to 12 per cent of the crude while the yield of residual fuel was about 50 per cent and the yield of gasoline obtainable by cracking the fuel oil was higher than that from gas oil.

While the clean circulation invention was of primary importance it was only one element in the development of the cracking process to its present high efficiency. Several hundred improvements and inventions were made and patented in the following years by Universal's staff. Some are in use today and are considered essential elements in the results which have been achieved.

A few among this number are: Nonresiduum operation. overhead feed, split feed, flashing, flashing to coke, low-level operation, quenching, multiple coil selective cracking, Equiflux furnace.

Billions of barrels of crude, beyond what the world has produced, would have been needed to supply enough gasoline without cracking, even if the quality had been suitable to match the requirements and the development of the automobile engine.

In 1920, 100 bbls. of average crude yielded the refiner about 26 bbls. of gasoline. In 1936, 100 bbls. yielded on the average 44 bbls. of gasoline. The steadily mounting percentage of gasoline yield synchronizes exactly with and is mainly, if not entirely, due to the increasing use of the cracking process which made possible the conversion of the heavy ends of the crude (fuel oil) into gasoline.



EXPERIMENTAL SELECTIVE CRACKING UNIT

After the first cracking unit in the Roxana plant had been running for some time, the news got around that it was operating successfully, making gasoline from fuel oil, but it was months before the information actually took hold and was translated by other refiners into action. In 1922 only two licensed Universal cracking units were in operation and they had a combined charging capacity of 600 bbls. a day.

STARTED IN 1923

In 1923 the swing to cracking began in earnest—the most far-reaching movement in the history of the oil industry—perhaps in any industry.

Sixty-five new Dubbs cracking units were put in operation in 1923, with a daily capacity of 42,000 bbls., and by companies to which cracking—at least suitable cracking—had not been available before.

It was brought out in the trial of Universal vs. Root Re-

DUBBS INSTALLATIONS

Combined Capacity

Dubbs Cracking Units in United States

BARRELS CHARGED DAILY

Arkansas	2,000	Maryland	1,800
California	139,000	New Mexico	1,050
Colorado	1,000	Ohio	2,500
Illinois	25,000	Oklahoma	43,000
Indiana	27,000	Pennsylvania	9,300
Kansas	21,000	Texas	56,900
Kentucky	4,500	West Virginia	1,500
Louisiana	15,000	Wyoming	6,000
Montana	5,150		
Michigan	8,600	**Total United States**	**370,300**

THROUGHOUT WORLD

Combined Capacity

Dubbs Units in Foreign Countries

BARRELS CHARGED DAILY

Canada	9,800	Dutch West Indies	72,000
Roumania	47,900	Dutch East Indies	24,500
Italy	11,300	Egypt	10,300
France	17,000	Iran	1,500
Belgium	300	Persian Gulf	16,400
Germany	2,500	India	4,600
Holland	9,000	Canary Islands	2,000
Sweden	800	Japan	1,000
Czechoslovakia	1,100	Manchuria	850
Mexico	8,700	Australia	600
Uruguay	1,200	British West Indies	10,000
Argentina	18,450	**Total Foreign**	**271,800**

APPARATUS FOR GAS ANALYSIS

In 1924 Standard of California signed a license contract with Universal, and have since then used only the Dubbs process, with yearly enlargements of their capacity.

The following table shows the yearly installations by Universal in various refineries:

	No. units started operating	Daily charging capacity (bbls.)
1921	1	200
1922	2	600
1923	65	42,000
1924	28	17,000
1925	18	11,000
1926	44	63,000
1927	40	95,000
1928	23	54,000
1929	24	50,000

fining Co. in 1934 that: "This (Dubbs) was absolutely the first commercially operative cracking process for the manufacture of large yields of gasoline so contrived that it could use as a charging stock other oil than an especially prepared distillate oil."

The Standard Oil Co. of California was the second big company to sign a license agreement with Universal. This was done after the company had used other processes which were later abandoned.

Concerning these stills R. W. Hanna, vice president of Standard of California testified in the Root case:

"We abandoned the two Burton-Clark type stills due to the very high cost of the resulting gasoline, which high cost was due to the low capacity, low yields. . . . .

"The Burton shell still cycle from charge to charge varied from 36 to 48 hours, 50 per cent of which time it was on stream, or producing pressure distillate. The Clark tube still had an approximately 60-hour cycle. . . . . The smaller part of the 50 per cent of the time of the cycle was utilized in charging and starting and the major part of the idle time in cleaning the carbon out of the system, the tubes and the shells."

The Standard company sent a man to study a Dubbs unit which was in operation in the plant of the Shell company at Martinez, Calif. When Mr. Hanna received the report of this visit he wrote to the officers of his company on October 4, 1923:

"In studying over these reports (report relative to the Dubbs operation) it would seem to me that we have picked up the following:

"Cleanliness is next to Godliness.

"That the Dubbs people anticipate us in appreciation of cleanliness.

"That if the maximum degree of cleanliness is maintained, higher furnace efficiency can be attained."

Thus at the end of 1929, 243 Dubbs cracking units had been built and their rated daily charging capacity was 332,000 bbls. of oil—any part of the crude.

But figures where cracking is concerned, are never static. By 1929 some of the earliest units had become out-dated by the rapid march of Universal's later developments and had been replaced. New units had been built and in some cases one big unit had been installed to replace two or more old smaller ones, and so it has gone on ever since. The hard years of the depression slowed up but never stopped the building of new units, the replacement and reconstruction of old ones.

In 1921, there were 10,000,000 automobiles registered in the United States. Total gasoline production was 122,000,000 bbls., of which only 20,000,000 bbls. were produced by cracking.

In 1923, production of cracked gasoline increased by 100 per cent while total gasoline production increased only 46 per cent. One barrel of cracked gasoline was produced to about every 4 bbls. of straightrun. Natural gasoline was not much of a factor at that time.

EXCEEDS STRAIGHTRUN

In 1936, cracking for the first time outstripped straight distillation as a source of gasoline. More cracked gasoline than straightrun was produced by refineries in the U. S. Of the total of 512,000,000 bbls. of gasoline made in 1936, 239,000,000 bbls. were cracked gasoline, 231,000,000 bbls. were straightrun and 42,000,000 bbls. were natural gasoline, produced from natural gas.

In 15 years, standards of gasoline quality as held by the trade and the public, have been completely turned around. Cracked gasoline, once despised, is now everywhere accepted as the preferred (first grade) product, while straight-

RELATIVELY FEW PEOPLE ACTUALLY KNOW WHAT A CATALYST IS BUT IN RECENT YEARS THE REFINING INDUSTRY HAS COME TO LEARN OF ITS IMPORTANCE IN CERTAIN TYPES OF POLYMERIZATION PROCESSES. ABOVE ARE THREE TYPES

run, formerly the favorite, now bears the shabby name "third grade" and finds a restricted market which even the bait of cut prices cannot keep from shrinking month by month. It seems inevitable that this trend toward more and better cracking will continue and even accelerate as automobile and aircraft engines, improved every year, make more and more exacting demands for motor fuel of special characteristics and super quality.

To one who studies refining progress and keeps in touch with developments from week to week, it is evident that cracking, vital as it is to the industry and the world, is only the beginning, not the end, of development in the refining industry and better application of crude oil and its derivatives to the needs of mankind.

NEVER DONE

One thing leads to another in petroleum research. No sooner is one job well done than other possibilities shape themselves in the minds of research workers; other problems confront them just as important, perhaps just as difficult as the ones they have solved. The development of cracking, has suggested and initiated many complementary and supplementary processes. Some of these are already in commercial operation. Others are in various stages of development. Still others are merely visible in outline down the long endless road that lies ahead.

IMPORTANCE OF CRACKING

To get a proper understanding of the importance of the modern cracking process in the conservation of crude oil, consider the following figures:

In 1936 alone, the cracking process in the refineries of the world conserved 1,865,000,000 bbls. of crude. It would have required 3,607,000,000 bbls. instead of the 1,742,000,000 bbls. of crude oil actually refined to have supplied the world's need for gasoline.

Aside from the saving of crude oil, consider the effect on the entire organization of the oil industry.

If the modern cracking process had not been developed it would have been necessary to locate more oil fields, expand storage facilities, install additional pipe lines and refining capacity to take care of the additional 1,865,000,000 bbls. of crude, which refiners would have had to process to supply the world's needs for gasoline in 1936. Where could the money come from to finance such a gigantic program?

PILOT PLANT FOR CATALYTIC WORK

Not only does the modern cracking process produce gasoline but also fuel oil, coke and gas. Now it is further widening its scope far beyond the limits of the fuel field.

It is already becoming an important source of a large number of chemical derivatives among which are acetylene, alcohols, glycols, aldehydes, acids, esters, ethers, chloro- and nitro- deriva-

tives suitable for solvents and explosives, synthetic lubricating oils, resins, rubber substitutes and synthetic rubber. Of these products more is explained in the description of the work at Riverside laboratories.

The development of these various processes has stimulated development in and provided markets for other industries as well. Notable among these is the steel industry. In the early days of cracking the technologists were held back by limitations other than their own. Even had they been masters of the technique of today they would not have been able to apply it, because the best materials of construction then available could not withstand some of the high temperatures and pressures, the severe conditions under which cracking operations are carried on today.

So development of the refining industry was slowed up by the lack of proper materials out of which to build equipment that the cracking pioneers knew would do a better job if they could get them.

OTHER INDUSTRIES

The insistent demand for better materials of construction spurred the steel manufacturers and the metallurgists to research efforts, out of which have been developed alloy steels and other metals which meet the needs.

It was much the same with pumps suitable for handling oil at high temperature and pressure; with instruments for indicating, recording and controlling the operations of the process. Difficulties of construction and operation have been hard to conquer but they have yielded to patience, technical skill and common sense.

There have been other problems still more difficult to overcome. These are fanciful notions and prejudices of motorists and officials, born of unjustified suspicions, which at times have hindered sales and have imposed unnecessary and wasteful expense on refining operations.

The sulfur bogy is one of these.

Several years ago a United States government bureau wrote into the specifications for gasoline to be bought for government use, a provision that it must contain not more than 0.1 per cent of sulfur. It was believed then that more than that percentage of sulfur was harmful to engines. But Universal technologists determined that it was not. They led a campaign of education that proved that fact to the trade.

Today billions of gallons of gasoline, some of it containing as high as .4 per cent sulfur, are being sold in many states, and used without the slightest harm to engines.

Results: To the refiners, savings in cost of chemicals, and savings in gasoline. To the motorists, good gasoline and safe gasoline at lower cost.

COLOR FALLACY

Akin to the sulfur bogy was the color fallacy. It was believed that unless gasoline was water white it was not good gasoline. This belief wasted millions a year, in cost of unnecessary chemicals, waste of gasoline in treating, in loss of the antiknock constituents of the gasoline.

To obtain water white color the antiknock substances had to be sacrificed, because they were the color forming substances too.

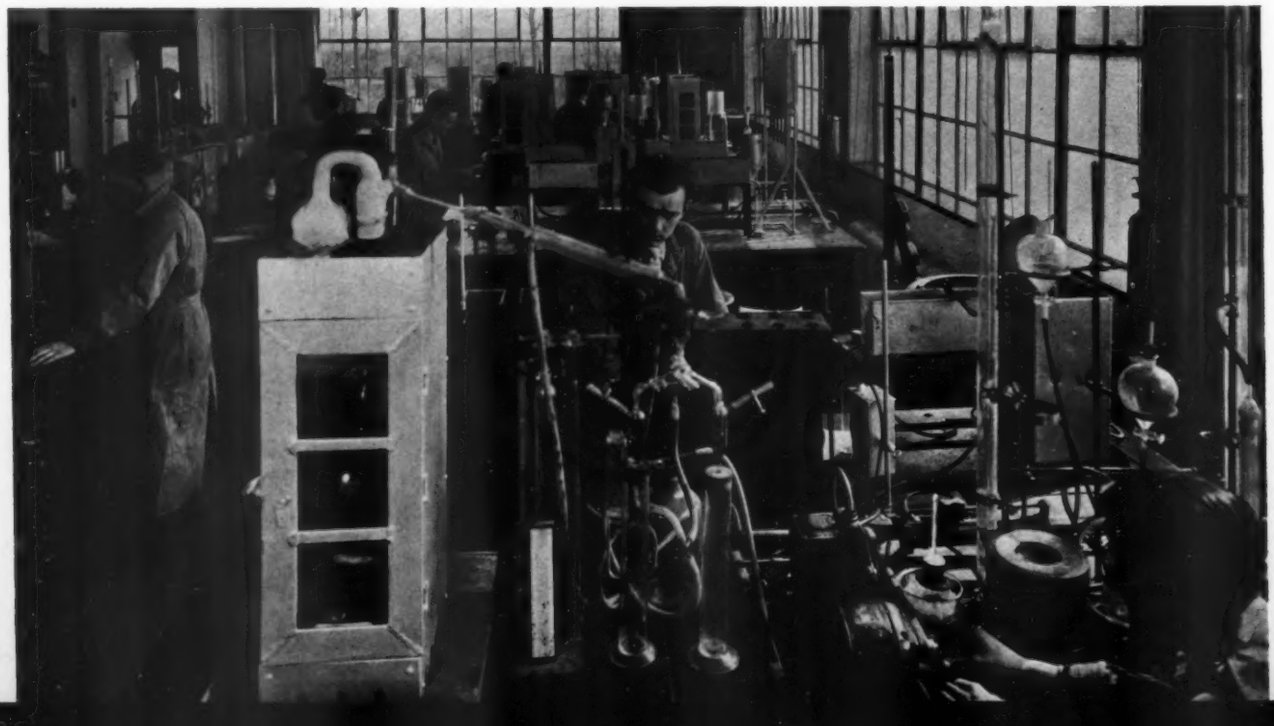
Universal men went to the front with evidence that exploded the color fallacy. It is largely due to their findings that color has been dropped from the prevailing specifications for gasoline. In fact, dyeing with distinctive colors and tints, has become general. It gets the motorist away from the water white complex and also identifies individual brands of gasoline.

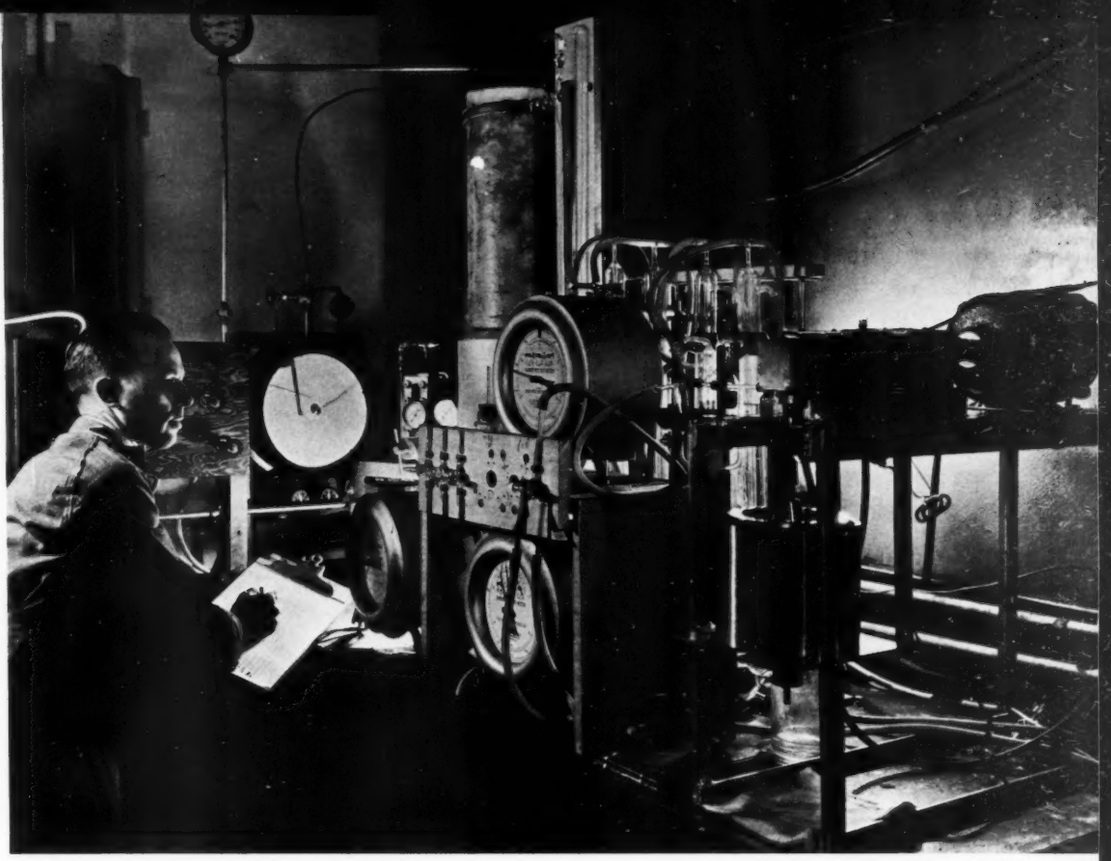
Where does Universal bring its achievements to pass? Mostly in the Chicago area.

Located a few miles apart, one in Chicago, another in a quiet southwestern suburb and the third in the busy industrial district of East Chicago are three organic and dynamic parts of the organization.

One of these is the main office of the company with a pleasant outlook over Lake Michigan; the second is the research, development and service laboratory at Riverside, and the third the commercial-size (1,000-bbl.) cracking unit and development plant at East

THE CONTROL LABORATORY





APPARATUS FOR EXPERIMENTAL WORK IN CATALYTIC DEHYDROGENATION

Chicago, located in the heart of a large refinery.

A thousand miles away from the daily administrative routine, yet as near as the telephone at his elbow, President Halle, from his office in New York, oversees the world-wide activities of his organization.

Chicago is the headquarters of Vice President Joseph G. Alther, who is in direct command of all Universal operations and its staff of over 600 people.

Foreign business is handled at close range by Universal's representatives through their respective offices in London and Bucharest. About 300 men work in Chicago and about 250 in the research laboratories at Riverside. Those are their respective headquarters. But many of them are out in the field a good deal of the time. They are scattered among the company's far-flung field operations according to the need of the service, from England to the Far East; from Canada to the Argentine, in practically every country where oil is found or gasoline is produced.

Most of the men, both in Chicago and at Riverside are scientific and technical school graduates, given practical training by Universal, in design, construction and operation.

Applications for employment are always on file. Youngsters and veterans want to work for Universal, the former to get the right start, the latter to improve their opportunities.

FIELD SERVICE

It is not unusual for one of the company's engineers—or several—to spend weeks at a time in a licensee's plant, studying its operations and its problems, lining out new operations, laying out operating schedules, making helpful suggestions to operators. Then they report their findings and recommendations for final decision of the refinery management.

Recognition and promotion for more than one ambitious refinery operating man has dated from the day he put into practice suggestions or information passed along to him by some friendly chap of the Universal engineering department.

The saving of businesses from disaster is always news. Stories have been printed in The Oil and Gas Journal and other papers of more than one case where the equities of stockholders in bankrupt oil companies have been restored to value when courts, having been shown the advantages and profitability of cracking, have authorized its installation, even preliminary to reorganization; in fact paving the way for reorganization.

For its administration, Universal's organization is departmentalized, but for purposes of work the lines between divisions disappear. The work is so closely interrelated it is almost impossible to tell where one group's province ends and another begins. It is team work at its best.

The atmosphere of Universal encourages thinking. It is an incubator of ideas. It is interesting for an outsider to observe, as the writer did, how an idea or a theory is treated once it is hatched. It moves forward in a straight line—to realization and usefulness if it is good; to the discard if it proves otherwise. First, it is set down on paper. Trained men are assigned to test it. They try it out in laboratory glass, usually designing the apparatus for the purpose. The investigator may find his answer in a teaspoonful, maybe only a few drops of product.

If the results are promising, the experimentation is carried farther, this time in a pilot plant which may run with a couple of gallons or a barrel a day of raw material, producing products in like proportion.

SEMIWORKS PLANT

If results are still favorable the work is stepped up to a semiworks scale, running 10 to 200 bbls. of material, and, if good results are obtained, the work then goes into the full plant-scale unit at East Chicago or elsewhere.

After the process has been tried out in the plant-scale unit it is well on the way toward full commercial status; for the attention of licensees and for the information of the entire industry.

The transition from the laboratory to the semiworks scale is one of painstaking research and intensive development. Before a research is begun the theory is developed and a complete literature search is made of the known prior

art including patents which may have a bearing on the subject. During the progress of this literature search, preliminary exploratory experiments are made to test the theories of the research chemist, and numerous conferences are held with the group leaders and directors of research.

The organization is divided into groups of specialists. Organic chemists, physical chemists, physicists, and mathematicians make up these groups, and their work dovetails nicely. There are groups also whose work relates to specific types of problems such as catalysts, treating, cracking, etc. Service divisions such as analytical, gas analysis, and routine are available for the research groups as well as for their own activities.

Development progresses step by step.

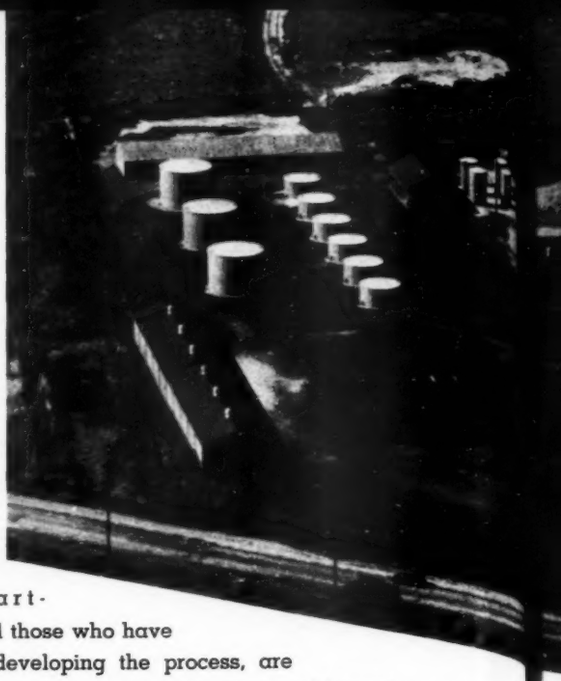
When a research is well along, the chemists engaged in it and the group leaders and directors begin to confer with the men in the development department and the process design division. The problems relating to the pilot plant operation from which is to be obtained the information for the design and operation of a commercial unit are carefully considered at these conferences.

PROCEDURE FOLLOWED

Experiments are laid out which have for their object obtaining such information as rates of flow, time of contact, heat transfer, effect of materials of construction upon a catalyst, and a large number of other factors.

The pilot plant is designed to simulate as far as possible the projected commercial plant design.

All the way along the line from the first figures set down on paper to the last run on the plant-size unit, careful data have been accumulated on every phase of the operations. These data are then turned over to the engineering department to serve as the basis of design for commercial units to operate the process. But the engineering department does not work alone on it. All the scientific and engineering talent of the organization is called into play. The members of the engineering department, as well as all those who have had any part in developing the process, are called into conference. They discuss the data and lay out a tentative design. The engineering department brings to such conferences specialists in every required phase of design and construction.



Out of the study conferences, after all aspects of the problems have been considered, after all viewpoints have been heard, a tentative design is formulated from which a schematic drawing is made up. Then the drawing is returned for discussion before another conference. It is pinned on the wall for analysis and dissection. Engineers, chemists and physicists go over the whole matter again, checking this point and that, arguing out the doubtful points.

After each one of these discussions the drawings scarred with changes and corrections, are returned to the drafting room to be redrawn in line with better clarified knowledge that has been brought out. When the need for it is indicated, outside consultants with specialized knowledge of the problems involved may be called in to add the weight of their knowledge and experience. It is a common occurrence for the leading engineers of the greatest oil companies, as well as some of the smallest, to sit in for weeks at a time with Universal's staff, studying processes and operations, asking questions, contributing ideas and knowledge of their own, each side learning something from the other and then applying the results.

NEW BUILDING UNDER CONSTRUCTION AT RIVERSIDE. IT WILL BE USED TO HOUSE SEMIWORKS EQUIPMENT

Such technical conferences are held as preliminary to the design of every unit, no matter how small or large, so the massed force of the entire staff is thrown into every job.

When a refiner, big or little, comes to Universal, the organization immediately becomes, for the time being, and for as long as necessary, his consulting engineering staff. He becomes in fact a member of the family. He is made to feel "at home."

When the design of a job is decided upon, materials for construction are considered and specified. The purchasing

AERIAL VIEW OF THE RIVERSIDE LABORATORIES WHERE UNIVERSAL DEVELOPS IDEAS FROM THE TEST-TUBE STAGE THROUGH THE SEMIWORKS TO COMMERCIAL PRACTICABILITY

department, engineering-minded, sits in on such conferences to get the engineer's viewpoint in placing orders for the material. The materials and equipment best suited to the purpose are always insisted upon. Universal's uncompromising standards and its importance as a buyer (purchases for the account of licensees run to millions a year) have spurred many industries to improve their products and to develop new ones.

In the early days of cracking, pressure vessels were riveted, then hammer-welded with walls as much as 4 inches thick. Then, to meet the exacting requirements electric welding was developed and proved its worth. X-ray inspection of the welds is the safeguard against any internal weakness or defect.

The use of alloy steels has increased strength and reduced the weight of pressure vessels. Two-inch thickness of the right kind of steel is now replacing 4 inches of plain carbon steel.

Pumps too have followed the development and met the exacting needs of the cracking process.

HOT OIL PUMPS

Fifteen years ago, pump company engineers laughed at the idea that oil at high temperatures could be pumped satisfactorily. But the cracking process had to pump hot oil. So the pumps to do it were developed and today it is commonplace to pump oil at a temperature of 900 to 1,000° F. and under pressure of several hundred pounds.

The best results in cracking demand close and automatic control of operation. There were no instruments suitable for the purpose in the early days. They had to be designed and developed. Cracking engineers helped the instrument makers. The instruments now used would delight the heart of the finest watch maker.

Yes, the stimulus that development of the cracking process has lent to other industries is great. But its contributions to the refining industry are incalculable.

It takes two entire floors of the Chicago office building to house Universal's drafting department alone. Right now more than 200 draftsmen are at work. Thumbtacked to their drawing boards, drawings are under way for cracking units that will give additional capacity of more than 100,000 bbls. a day.

Plans are also in progress for more than a dozen polymerization units and iso-octane plants.

The building of these units will put more than $25,000,000 into thousands of pay envelopes and into the pockets of material suppliers and equipment manufacturers.

COST ESTIMATES

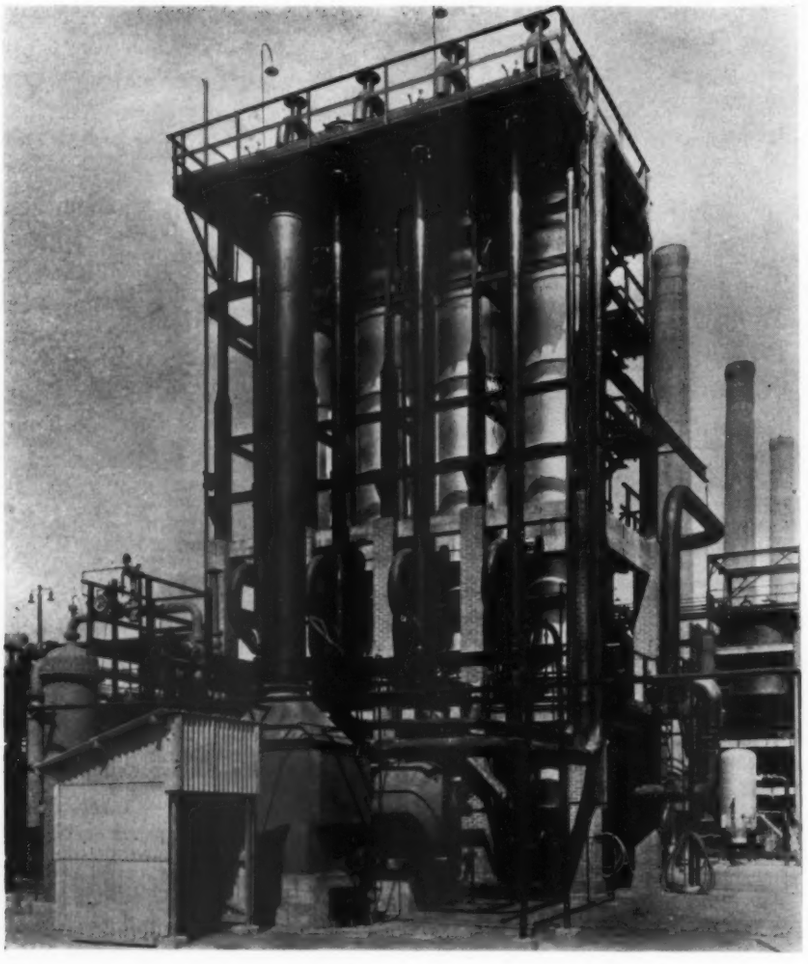
When designs and drawings for a plant are completed, after passing through the various stages of research, development, process design, engineering design and drafting, the drawings are turned over to the construction—engineering department for cost estimates.

Universal is not engaged in construction work as a contractor but it maintains a staff of engineers to supervise or to take full charge of the construction work, as the licensee prefers. Even when outside contractors are employed, a Universal supervising engineer is always on the job to insure that the exacting standards and specifications set up by Universal are being met.

Supervision by Universal continues throughout the working life of every unit. Periodic inspections are made. Pressure vessels and all the rest of the equipment have to pass scrutiny by the eagle eyes of Universal inspectors, who report on their condition as a basis for fixing safe limits for operating temperatures and pressures.

Research leads to invention and invention leads to patents.

The high spots of Universal's patent litigation through the years have an important bearing on the strength of its position. It is an interesting chapter in Universal's history.



NEW 8,000,000 CUBIC FOOT POLYMERIZATION UNIT NOW IN OPERATION AT PORT ARTHUR, TEXAS

It goes back to 1916, the year after Patent No. 1,123,502 was issued to Jesse A. Dubbs. This patent covered heating and distillation of oil and condensation of the oil vapors while maintaining through the still and condenser a uniform superatmospheric pressure exerted by the vapors generated in the operation. Universal entered into negotiations with Standard of Indiana but no satisfactory basis of settlement was possible at the time. Universal then sued Standard of Indiana, charging that its operation of the Burton and Burton-Clark processes infringed the Jesse A. Dubbs patent. This suit was filed in 1916. The case was in the courts for 15 years.

The scene of the suit was the Federal Court in Kansas City but the battleground was the continent. Hearings were before a master appointed by the court and he held sessions in different cities throughout the country.

Attorneys, expert witnesses and operating men dashed back and forth between California, New York, Chicago and Kansas City. They built special units and made demonstration runs, they observed runs in other refineries, they examined witnesses, they took depositions.

A highspot of the trial was the testimony of Universal's Dr. Gustav Egloff, who was an expert witness for the plaintiff. The hearing was in St. Louis in February, 1928.

Opposing counsel asked him to define "Emulsions," to do so fully and to take all the necessary time.

He did, and it took him six weeks to do full justice to the subject.

This incident is still remembered by veterans in the industry and at the time it inspired the following editorial, which was published in the St. Louis Post Dispatch:

Here's to Dr. Egloff

"We are lost in admiration of Doctor Egloff, oil expert of the Universal Oil Products Co. of Chicago. In the dim, dead days of last November, he took the witness stand in a suit of his company against the Standard Oil Co. No matter what the suit is about. Doctor Egloff today (February 16) is still on the stand and still talking. The workaday world has saluted the Armistice Day colors, waxed fat on Thanksgiving turkey, dressed a Christmas tree, observed the New Year's saturnalia and paid court to its lady love on the day of St. Valentine — and Doctor Egloff is still testifying. How does he do it? Well, one day an unwary attorney asked him to define *emulsion*. Snapping into the subject, Doctor Egloff answered him in seven calendar days of four hours each.

"We recall Senator Morgan's mot. 'How long, Senator,' inquired a young lady, 'can you speak on any given subject?' 'It all depends, my dear,' replied the great solon gravely. 'If it is a subject I know all about, I can talk for 30 minutes at a stretch. If it is a subject on which I am completely ignorant, I can talk indefinitely.'

"Such is not the case with Doctor Egloff. He who doubts that Doctor Egloff understands the etiology, etymology, anthropology and cosmology of emulsion is automatically elected to the skeptic's society. We are confident that Doctor Egloff, far from being addicted to Morganatic bombast, is a profound scientist. We repeat that we admire him, but—remembering the seven-day reply to the emulsion question—we would never be so incautious, especially if we were in a hurry, to ask him what time it is."

By the time a settlement was reached in 1931, the record had mounted to 22,000 typewritten pages and millions had been spent by both sides.

Substantial sums were paid to Universal by Standard of Indiana and other large companies which were involved. Valuable rights and immunities were granted by those companies to Universal and its licensees. All lawsuits pending

between the companies which figured in the settlement were dismissed.

The Texas Company earlier had brought suit against Warner-Quinlan Company, a Dubbs licensee, charging that operation of the Dubbs process infringed certain patents issued to Joseph H. Adams of Brooklyn, which were owned by The Texas Company. This suit was defended by Universal and was fought bitterly.

Universal and Warner-Quinlan won. On January 6, 1931, Judge William M. Runyon, sitting in Federal Court in the district of New Jersey, found judgment in favor of Warner-Quinlan and Universal.

It was a dramatic moment when the news of the Warner-Quinlan decision was telephoned to Universal in Chicago at noon January 6, 1931. Executives and attorneys of the biggest oil companies in the country, including The Texas Co. and some of those which had sought the protection of the Adams patents, were gathered in the offices of Universal at Chicago with the officers and attorneys of Universal, ready to complete the most important treaty of peace in the history of the industry.

Terms had been agreed on, papers were ready to sign when the flash came. That decision strengthened Universal's position but did not vitiate its word. The agreements that had been arrived at were signed.

Another important litigation was Universal's suit against the Skelly Oil Co., for infringement of the Trumble patent, acquired from the Shell interests. This suit was carried through the federal district court at Wilmington, Del., and the circuit court of appeals, the Judges in that court unanimously affirming Universal's position as decided in the district court. Hearings before a master to determine the amount of damages to be awarded, are still in the process of settlement.

Following the Skelly case, Universal sued the Root Refining Co. on the Dubbs "clean circulation" and Egloff two-coil selective cracking patents, charging infringement of these patents by the operation of a so-called Winkler-Koch still at the refinery of the Root company.

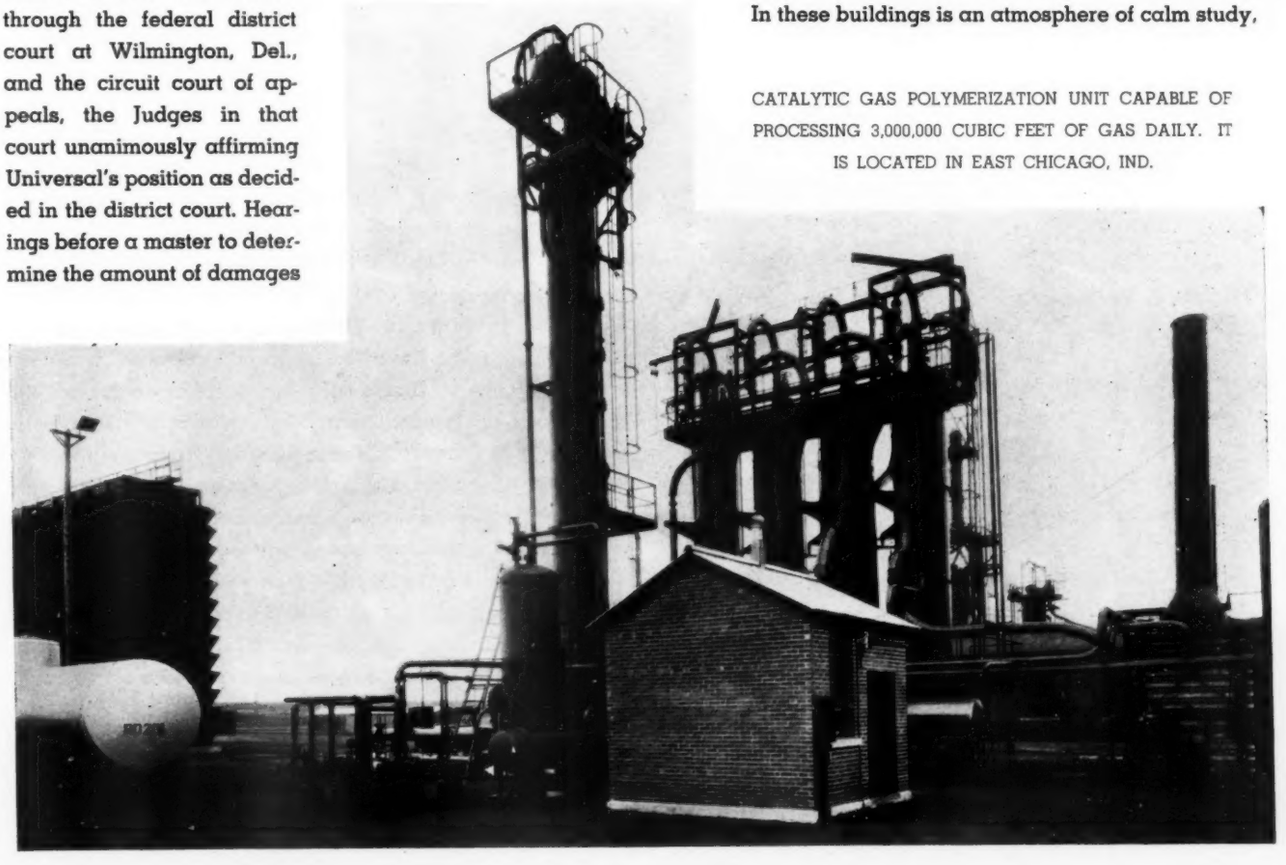
The case was heard by Federal Judge John P. Nields sitting in Federal Court in Wilmington, Del. Universal won on both patents in the district court and in the Court of Appeals. A petition for certiorari to the Supreme Court of the United States was denied—the case has been referred to a master for an accounting of profits and damages.

Just within the past month another Universal infringement suit has ended in a dramatic climax. The defendant was the National Refining Co. Universal charged infringement of its clean circulation and other patents by the operation of so-called Winkler-Koch cracking units in National's refinery at Coffeyville, Kans.

NATIONAL CASE

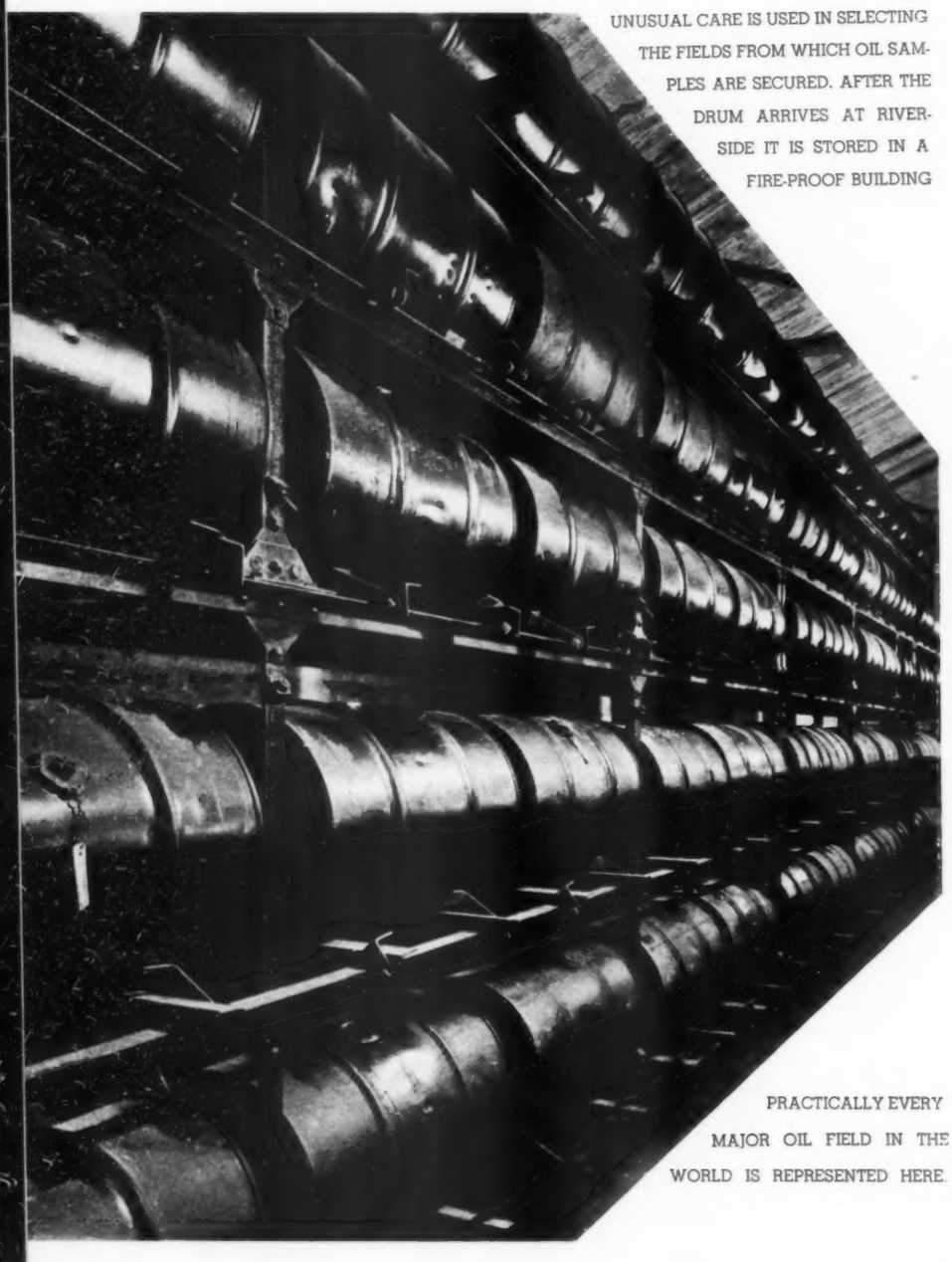
This case was definitely set for trial in Federal Court in Topeka, Kans., on April 26 last. Five days before, on April 21, in the home office of the National in Cleveland, Ohio, H. J. Halle, president of Universal, and W. H. Lamprecht, president of National, signed a license agreement. Universal's claims for past infringement were settled and the suit was dismissed.

The Universal company's research and development laboratories are located at Riverside, Ill. In these buildings is an atmosphere of calm study,



CATALYTIC GAS POLYMERIZATION UNIT CAPABLE OF PROCESSING 3,000,000 CUBIC FEET OF GAS DAILY. IT IS LOCATED IN EAST CHICAGO, IND.

a suggestion of composure and order. It might be some quiet college campus. You walk through the building out on a landscaped terrace and quite a different view meets your eye. Spread out before you is a stretch of 25 acres on which is a collection of buildings of different sizes, tanks and strange-looking structures that might belong in a refinery. The place looks like a good-sized and growing industrial plant. Plumes of steam puff from exhaust pipes. Machinery is in motion, men are working; action is everywhere.



UNUSUAL CARE IS USED IN SELECTING THE FIELDS FROM WHICH OIL SAMPLES ARE SECURED. AFTER THE DRUM ARRIVES AT RIVERSIDE IT IS STORED IN A FIRE-PROOF BUILDING

PRACTICALLY EVERY MAJOR OIL FIELD IN THE WORLD IS REPRESENTED HERE.

If you had stopped to read the words on the stone tablet set in the front wall of the center building you would know that the things you are seeing make up the research and development laboratories of Universal Oil Products Co. at Riverside, 12 miles from Chicago—30 minutes by train or motor. The brick buildings house the administrative offices, the library, part of the laboratories, conference and study rooms, offices and shops. The other buildings provide accommodations for more laboratories and more shops, semi-works scale experimental equipment and the like. Then there are 25 acres covered by its large-scale activities.

One of the queer-looking structures in the yard has a story of its own. On tall supports it towers so high it can be seen from a distance as you drive along the highway. Well may it hold its head high, for it has starred in the drama of cracking development.

It is "Old Faithful," Dubbs No. 2, which means it was the second one built. Unit No. 1 was completed and started in operation in the Shell's Roxana refinery at Wood River, Ill., in 1921. (This numbering disregards earlier commercial development.) When No. 2 was built it was the largest in existence. Its charging capacity was 250 bbls. a day, exceeding Roxana's No. 1 by 50 bbls., but it was used exclusively for development and commercial test runs.

In No. 2 many of the features and methods that have made the Dubbs process were worked out. At first, while the experimenters were feeling their way, operations were in secret; later it became a show place for refiners from all over the world. The unit is now on the retired list. It has done its duty and remains an interesting monument to the early faith and work of those who did so much to develop cracking.

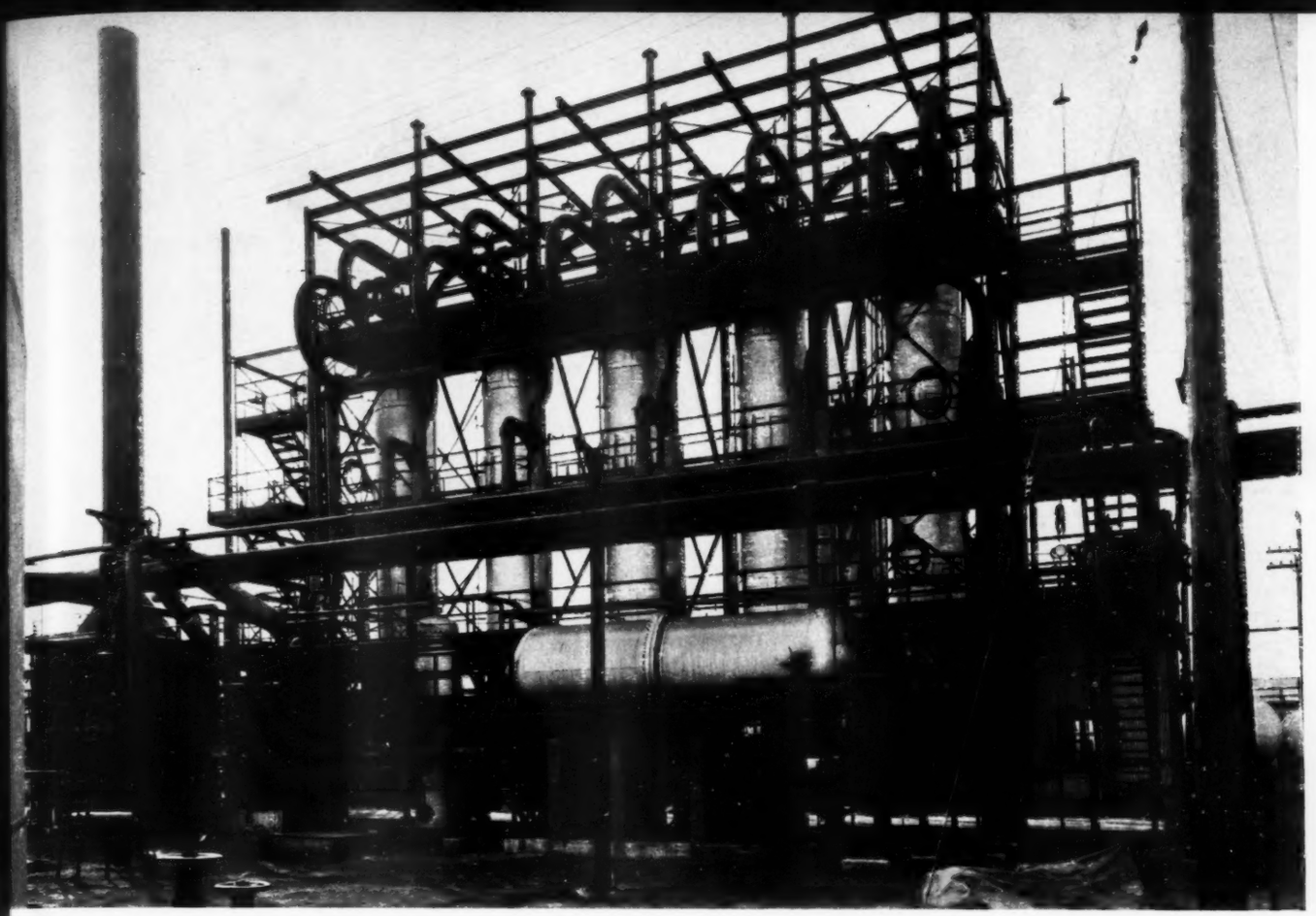
And there are others still standing there—old soldiers who have played their parts in the development of the cracking art and have also been retired. One was built at a cost of $90,000 to settle a disputed point in a legal contest that could only be determined by operation and demonstrated to those who contested it.

It ran only long enough to furnish the needed information and was then shut down, never to run again. It stands there starkly now, surrounded by a high fence.

The costs were high but justified by the priceless knowledge that was drawn from its operations.

As you look over the widely differing parts of this entire plant, two notes impress themselves upon you—knowledge and action—and these blend to form a chord that is the true keynote at Riverside.

It would be hard to find an institution where the studious atmosphere of the university and the practical realism of the industrial world are so harmoniously and so usefully conjoined.



NEW CATALYTIC POLYMERIZATION UNIT NOW OPERATING IN A LARGE EAST CHICAGO REFINERY

More than 250 men are employed here, the majority of them in research. Many are men of broad scientific training—many have been awarded doctor's degrees by American or foreign universities, in some branch of chemistry, physics or engineering. Among them are some of the world's most notable scientists.

RIVERSIDE LABORATORIES

The Riverside laboratories were built in 1921-22 to provide a suitable home for the research and development which for years had been carried on at a disadvantage in the laboratory at Independence, Kans., supplemented in a private laboratory in Wilmette, a Chicago suburb. The technical executives of big companies, not only in the petroleum industry but in others, have said there are not many laboratories where a project can be carried from theoretical calculations right on through laboratory glass, pilot and semiworks stages on such a scale, with such thoroughness.

And from semiworks it is carried on to full-size commercial operation by engineers in the commercial development department. These research men are never interrupted for work on regular commercial operating units.

This laboratory is a unique institution in other respects. Its results, findings and developments are available to the whole industry. Results of other laboratories usually are available only to a single company for its own use or to a few related companies. Pioneer in the policy of giving out useful information, discoveries made and new processes developed here, are announced and described to the industry as soon as this can be done safely.

The field of combustion is an old one—one of the very oldest. Furnace design was standardized and well understood. It was generally assumed that the ultimate had been reached in the design of furnaces. But not by Universal's staff. One of the greatest contributions to the field of furnace design has been made, through inventions based on his observations and study, by J. G. Alther, vice president of Universal, who is in charge of its operating departments, including the laboratories.

It is acknowledged that the Equiflux furnace marks a long step ahead in the combustion engineering field and is a prime improvement in the oil cracking process. It makes use of principles of combustion never known before.

In the early days, refiners demanded cracking demonstrations on plant scale. They would believe only what they could see. Usually not less than a 200-bbl. test run on their own oil would they consider conclusive. That is why Dubbs No. 2 was built so big.

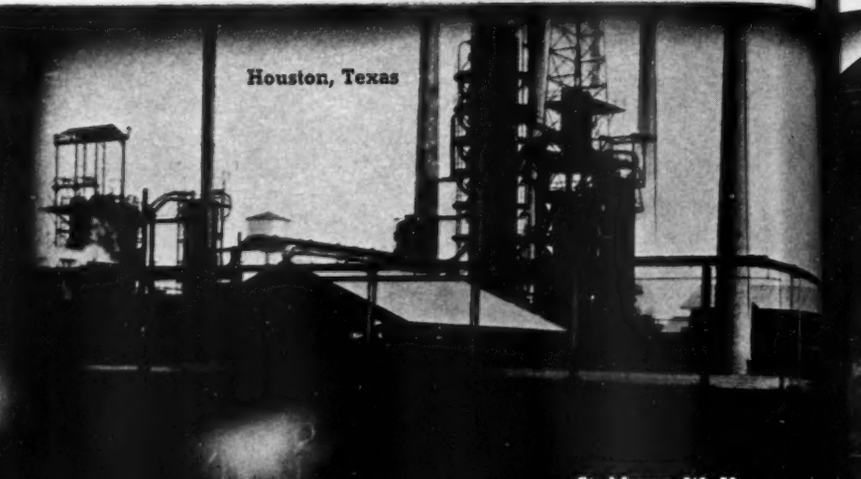
But runs on such a scale were awkward and very expensive. Such size samples had to come in tankcars, so the men at Riverside improved their technique until they were able to design apparatus to get the answer with a few gallons of oil in a small model of a large plant.

It took nearly 10 years and a substantial fortune to achieve this result. Now these men have gone a step farther than that.

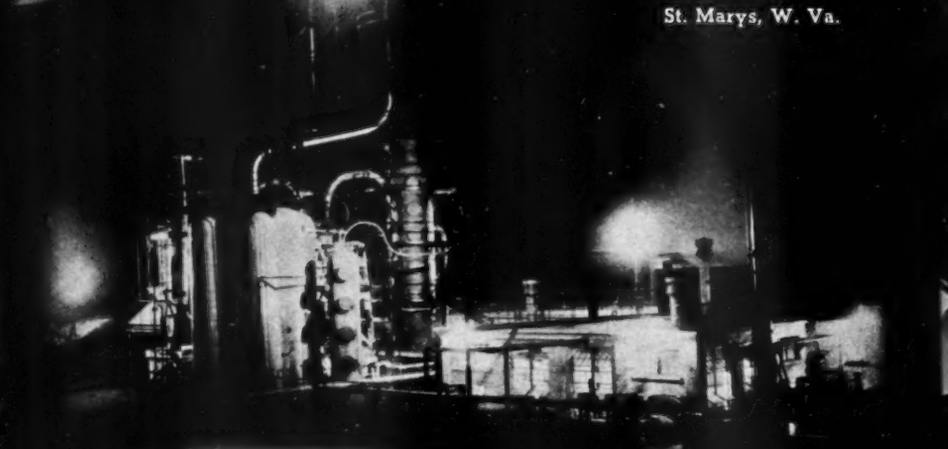
Based on their long and wide experience with a vast background of experimental data, a Universal technologist today can sit at his desk with the report of gravity, boiling range and viscosity tests of an oil before him and can quantitatively identify the oil as to whether it is paraffinic, naphthenic, or mixed.

DUBBS LICENSEES

East Texas


Houston, Texas

Brazi, Roumania

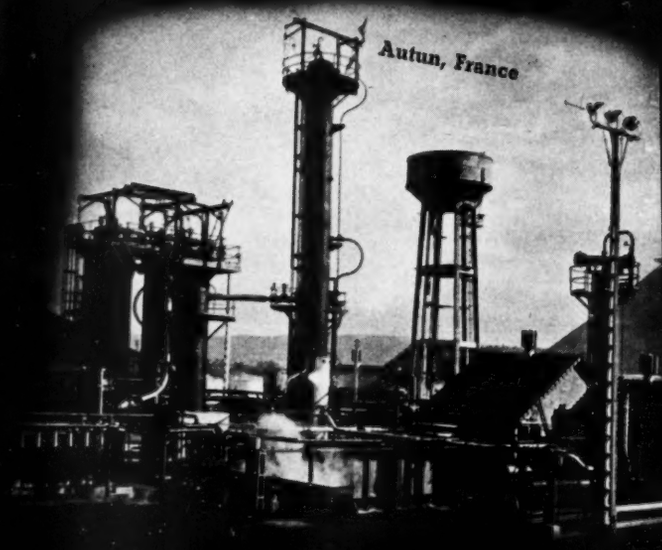

St. Marys, W. Va.

Santa Fe Springs, California

Allen, Oklahoma

UNITED STATES

Alco Refining Company
Canton, Ohio
American Refining Properties
Wichita Falls, Texas
Arro Oil & Refining Co.
Lewistown, Mont.
Ashland Refining Co.
Catlettsburg, Ky.
Associated Oil Co.
Avon, Calif.
Barnsdall Refining Corp.
Corpus Christi, Texas
Barnsdall Refining Corp.
Wichita, Kans.
The Bay Petroleum Corp.
Denver, Colo.
Bell Oil & Gas Co.
Grandfield, Okla.
Big West Oil Co.
Kevin, Mont.
Black Gold Refining Co.
Oklahoma City, Okla.
Continental Oil Co.
Baltimore, Md.
Continental Oil Co.
Ponca City, Okla.
Continental Oil Co.
Wichita Falls, Texas
Cosco Oil Company
Wynnewood, Okla.
Cosden Oil Corp.
Big Spring, Texas
Cushing Refining & Gasoline Co.
Cushing, Okla.
Deep Rock Oil Corp.
Cushing, Okla.
Eastern States Pet. Co., Inc.
Houston, Texas
Elk Refining Company
Falling Rock, W. Va.
Empire Oil & Refining Co.
Gainesville, Texas
Empire Oil & Refining Co.
Ponca City, Okla.
Freedom Oil Works Co.
Freedom, Pa.
Grayburg Oil Co.
San Antonio, Texas
Home Oil & Refining Co.
Great Falls, Mont.
Houston Oil Co. of Texas
Camden, Ark.
Imperial Refining Co.
Ardmore, Okla.
Independent Oil & Gas Co.
Kansas City, Kans.
Independent Oil & Gas Co.
Okmulgee, Okla.
Independent Refining Co.
Laurel, Mont.
Indian Refining Co.
Lawrenceville, Ill.
Interocean Oil Co.
Baltimore, Md.
Johnson Oil Refining Co.
Cleveland, Okla.
Kendall Refining Co.
Bradford, Pa.
Kettle Creek Refining Co.
El Dorado, Ark.
Leonard Refineries, Inc.
Alma, Mich.
Louisville Refining Co.
Louisville, Ky.
Malco Refineries, Inc.
Artesia, N. M.
McClanahan Refineries, Inc.
St. Louis, Mich.
Mid Continent Pet Corp.
West Tulsa, Okla.
Naph Sol Refining Co.
Muskegon, Mich.
National Refining Co.
Coffeyville, Kans.
National Refining Co.
Findlay, Ohio
Northwest Refining Co.
Cut Bank, Mont.
Ouachita Valley Refining Co.
El Dorado, Ark.
Panhandle Refining Co.
Wichita Falls, Texas
Pennzoil Co.
Oil City, Pa.
Producers & Refiners Corp.
Parco, Wyo.
Producers & Refiners Corp.
West Tulsa, Okla.
Pure Oil Co.
Ardmore, Okla.
Quaker State Oil Refining Corp.
Emlenton, Pa.
Quaker State Oil Refining Corp.
Farmers Valley, Pa.
Quaker State Oil Refining Corp.
St. Marys, W. Va.
Root Refining Co.
El Dorado, Ark.



The Shamrock Oil & Gas Corp.
Moore County, Texas
Shell Oil Co.
Dominguez, Calif.
Shell Oil Co.
Martinez, Calif.
Shell Oil Co.
Wilmington, Calif.
Shell Petroleum Corp.
Arkansas City, Kans.
Shell Petroleum Corp.
East Chicago, Ind.
Shell Petroleum Corp.
Houston, Texas
Shell Petroleum Corp.
Sellers, La.
Shell Petroleum Corp.
Wood River, Ill.
Solvex Refineries, Inc.
Gladewater, Texas
Spartan Refining Corp.

Standard Oil Co. of California
El Segundo, Calif.
Standard Oil Co. of California
Richmond, Calif.
Sunray Oil Co.
Allen, Okla.
Talco Asphalt and Refining Co.
Mount Pleasant, Texas
Texas Pacific Coal & Oil Co.
Wynnewood, Okla.
Tyler Texas Oil & Ref. Co.
Tyler, Texas
United Refining Company
Warren, Pa.
Valley Refining Company
Roswell, N. M.
Vickers Petroleum Co.
Potwin, Kans.
Waggoner Refining Co., Inc.
Electra, Texas
Warner-Quinlan Co.

White Star Refining Co.
Detroit, Mich.
White Star Refining Co.
Wood River, Ill.
H. F. Wilcox Oil & Gas Co.
Bristow, Okla.
Wilshire Oil Company
Santa Fe Springs, Calif.

FOREIGN

Administracion Nacional de Combustibles, Alcohol y Portland
Montevideo, Uruguay
Anglo-Egyptian Oilfields, Ltd.
Suez, Egypt
Anglo-Persian Oil Co., Ltd.
Llandarcy, Wales
Apollo, Rafineria Mineralnych Olejov Ucastinarska Spolocnost
Bratislava, Czechoslovakia
Arend Petroleum Company

Assam Oil Co., Ltd.
Digboi, India
Astra Romana Societate Anonima
Ploesti, Roumania
Azienda Generale Italiana Petroli
Venice, Italy
Bahrein Petroleum Co., Ltd.
Bahrein Island, Persia
Belgian Cracking Co.
Langerbrugge, Belgium
BENIT Societa Anonima Benzina Italiana
Naples, Italy
British American Oil Ref., Ltd.
Coutts, Canada
British American Oil Ref., Ltd.
Toronto, Canada
Burmah Oil Co., Ltd.
Rangoon, India
Columbia, Societe Franco-Roumaine de Petrole

Comet Oil Refineries, Ltd.
Point-aux-Trembles, Canada
Compania Espanola de Petroles, S. A.
Teneriffe, Canary Islands
Compania Mexicana de Petroleo "El Aguila" S. A.
Minatitlan, Mexico
Compania Mexicana de Petroleo "El Aguila" S. A.
Tampico, Mexico
Creditul Minier, S. A. Romana
Brazi, Roumania
Curacaosche Pet. Industrie, Mij
Curacao, D. W. I.
De Bataafsche Petroleum Mij
Balik Papan, Borneo, D. E. I.
De Bataafsche Petroleum Mij
Pernis, Holland
De Bataafsche Petroleum Mij
Pladjoe, Sumatra, D. E. I.
De Bataafsche Petroleum Mij
Tjepoe, Java, D. E. I.
Deutsche Erdol – Raffinerie, A. G.
Hanover, Germany
Diadema Argentina Sociedad Anonima de Petroleo
Buenos Aires, Argentina
John Fell & Co., Ltd.
Sydney, Australia
Japan Gasoline Co., Ltd.
Osaka, Japan
A. Johnson & Co.
Nynashamn, Sweden
Jupiter S. A. de Petroles
Pauillac, France
Jupiter S. A. de Petroles
Rouen, France
Lloyd Refineries, Ltd.
Port Credit, Canada
Nippon Oil Co., Ltd.
Yokohama, Japan
Dr. C. Otto & Co.
Holten, Germany
Petrol Block S. A. Romana
Ploetsi, Roumania
Petroleos de Mexico S. A.
Tampico, Mexico
Prahova S. A. Romana
Bucharest, Roumania
Raffineries de Petrole de la Gironde
Bordeaux, France
Refineria De Petroleo "La Isaura" Sociedad Anonima
Bahia Blanca, Argentina
Shell Oil Co. of Canada
Montreal, Canada
Societa per l'Industria Italiana del Petrolio
Spezia, Italy
Societe Lyonnaise des Schistes Bitumineux
Autun, France
South Manchuria Railway Co.
Fushun, Manchuria
Steaua Romana
Campina, Roumania
Trinidad Leaseholds, Ltd.
Pointe-a-Pierre, B. W. I.
"Unirea" S. A. de Petrol
Ploesti, Roumania

Catalytic Polymerization or Iso-Octane Licensees

UNITED STATES

Gulf Oil Corp.
Port Arthur, Texas
Pan-American Refining Corp.
Texas City, Texas
The Shamrock Oil & Gas Corp.
Moore County, Texas
Shell Petroleum Corp.
East Chicago, Ind.
Sinclair Refining Company
East Chicago, Ind.
Sinclair Refining Company
Marcus Hook, Penna.
Standard Oil Co. of La.
Baton Rouge, La.
The Texas Company
Lockport, Ill.
The Texas Company
Port Arthur, Texas
Wilshire Oil Co., Inc.
Santa Fe Springs, Calif.

FOREIGN

Anglo-Iranian Oil Co., Ltd.
Abadan, Persia
Creditul Minier, S. A. Romana
Brazi, Roumania
De Bataafsche Petroleum Mij
Curacao, D. W. I.
De Bataafsche Petroleum Mij
Pernis, Holland
Deutsche Erdol – Raffinerie, A. G.
Hanover, Germany
Mashinoimport-Glavneft
Grozny, U. S. S. R.
Mashinoimport-Glavneft
Saratov, U. S. S. R.
Mashinoimport-Glavneft
Ufa, U. S. S. R.
Petrol Block Societate Anonima Romana
Ploesti, Roumania
Trinidad Leaseholds, Ltd.

He can also accurately estimate its critical temperature and pressure, its hydrogen content, its rate of cracking and the yield and quality of the gasoline and residuum that its cracking will produce under right conditions.

The very characteristics that make cracked gasoline a superior motor fuel also present a difficult treating problem that does not exist with straightrun gasoline—the gum problem. The antiknock constituents are also the gum-forming constituents.

That was the refiner's dilemma. To rescue him from it, antioxidants or inhibitors have been developed and are being widely used.

PILOT CRACKING PLANT

The pilot cracking plant is a source of wonderment to visitors. It is kept in operation 24 hours a day, seven days a week.

One important function is the checking of testing engines in the laboratories of licensee companies so their results will be reproducible.

While the possibilities inherent in crude oil and its derivatives are being constantly explored and developed, Riverside is also developing men. General meetings are held where various phases of the research work are discussed and where the young workers sit side by side with the veterans—and the benefits are not always all on one side.

The eminent Prof. Vladimir N. Ipatieff brought to Universal the knowledge born of his long study and experience begun in Russia more than 35 years ago. His work in the field of high-pressure catalysis is outstanding.

A cracking operation formerly was considered nicely balanced if it generated enough fixed gas to furnish the fuel required to operate the unit. Not so any more. Cracked gas is the most expensive fuel a refiner can use, because it is the raw material from which catalytic polymerization makes a super gasoline. More than 170,000,000 cubic feet of cracked gas are being treated every day by this process, producing about 14,000 bbls. of valuable polymer gasoline. More than 5,000,000 bbls. will be produced during the present year.

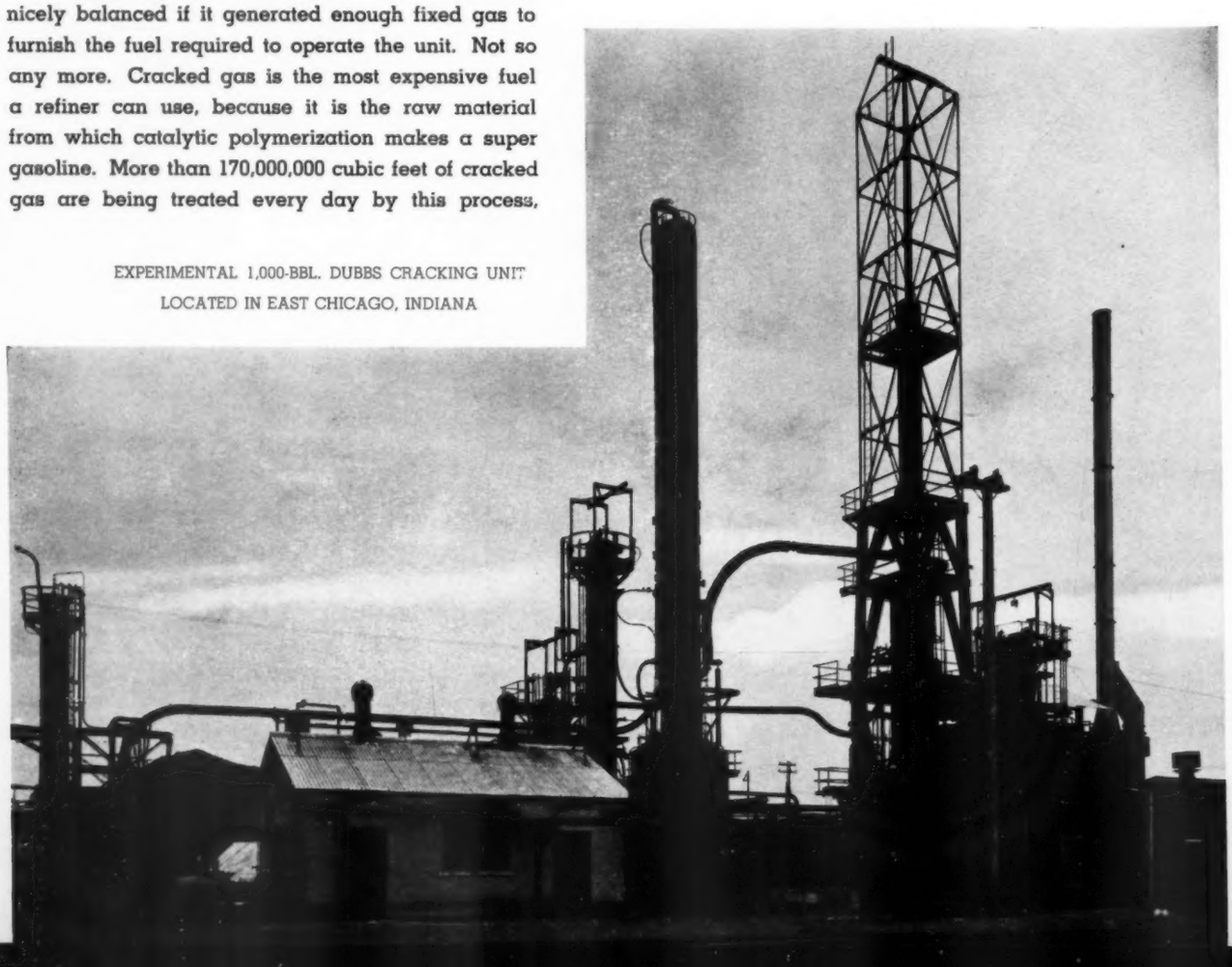
Polymer gasoline possesses super antiknock rating and unique blending value, which means unusual ability to enhance the octane rating of gasoline with which it is blended.

On the scale it is already projected, catalytic polymerization represents a saving of more than 35,000,000 bbls. of crude a year.

The iso-octane process is an outgrowth of the catalytic polymerization process as the former is an outgrowth—a further development of cracking. It is now producing, on a commercial scale, motor fuel of 95 to 100 octane rating for the use of commercial airliners and considered essential for fighting airplanes. The search for proper catalysts is a long and difficult job.

When a catalyst is finally selected, the job is only begun. It is studied as to its physical properties, how to prepare it to maintain its position in towers, properly exposing its surface to exercise its catalytic influence on the vapors and gases contacting with it; how best to place it, how best to regenerate and reactivate it.

The catalytic polymerization process for the production of high octane polymer gasoline and iso-octane are forerunners of a large number of reactions which bid fair to constitute a truly Universal catalytic family of processes. The interchangeability and substitution of one natural hydrocarbon resource by the other which will guarantee a continuing supply of motor fuel and hydrocarbon derivatives is one of the goals of Universal.



EXPERIMENTAL 1,000-BBL. DUBBS CRACKING UNIT
LOCATED IN EAST CHICAGO, INDIANA

Complex and Unsaturated Naphthene Hydrocarbons

By W. L. NELSON

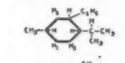
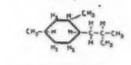
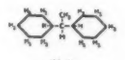
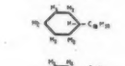
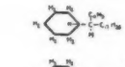
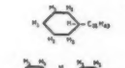
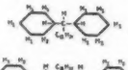
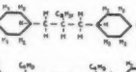
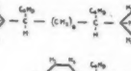
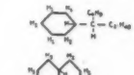
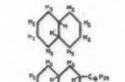
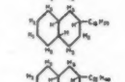
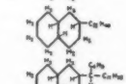
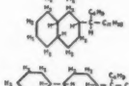
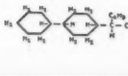
The complex and unsaturated naphthene hydrocarbons are perhaps the least known chemical series. However, to the best of our knowledge, these hydrocarbons or similar ones are the main constituents of lubricating oils. In this, as in previous articles, the specific gravities were brought to the common basis of 60° F. by computations.

The properties and constants of the simple naphthene hydrocarbons and a general discussion of their ring structure and bonding appeared in the April 1, 1937, issue of The Oil and Gas Journal. Properties of other hydrocarbons appeared in the January 7, February 4 and 18, and March 18 issues; and in 1936, in the November 26 issue.

References

4. Cross, Roy—"Handbook of Petroleum, Asphalt and Natural Gas," Bull. 25, Kansas City Testing Laboratory, K. C., Mo., 1928.
10. Brooks, B. T.—"Chemistry of the Nonbenzenoid Hydrocarbons,"
21. Mikiska, L. A.—"Chemical Structure of Lubricating Oils," Ind. Eng. Chem., 28, 970, 1936.
22. Rossini, F. D.—"Chemical Constitution of Lubricating Oils," Ref. & Nat. Gaso. Mfg., 14, 268, June, 1935.

COMPLEX NAPHTHE NE HYDROCARBONS

Hydrocarbon—	Formula	Structure	Molecular weight	Sp. gr. 60/60	Boiling point °F.	Melting point °F.	Viscos., Univ. Saybolt @100°F.	Viscos., Univ. Saybolt @210°F.	Viscosity index
1-Methyl 3-ethyl 4-isopropyl cyclohexane	$C_{12}H_{24}$		168 2	.817	406	.....	.....	.....	...
1-3 Dimethyl 4-isobutyl cyclohexane	$C_{12}H_{24}$		168 2	.819	381	.....	.....	.....	...
1-1 Dicyclohexyl ethane	$C_{14}H_{26}$		196	.937[21]	...	.....	.....	.....	...
Octadecyl cyclohexane	$C_{24}H_{48}$		336 4	.840[23]	...	104[21]	73 2[21]	38.7[21]	160[21]
5 Cyclohexyl duocosane	$C_{28}H_{56}$		392 4	.846[21.5]	...	.....	99[23]	41 1[21]	140[21]
Duocosyl cyclohexane	$C_{28}H_{56}$		392 4	.839[23]	...	120 2[21]	99[21]	41.8[21]	170[21]
1-1 Dicyclohexyl hexadecane	$C_{28}H_{54}$		390 4	.882[22]	...	.....	157.2[22]	43 4[22]	98[22]
1-Cyclohexyl, 2-hexahydrobenzyl heptadecane	$C_{30}H_{58}$		418 5	.889[22]	...	.....	146 2[22]	42 9[22]	103[22]
5-13 Cyclohexyl octadecane	$C_{30}H_{58}$		418 5	....	...	.....	241[21]	48[21]	88[21]
5 Cyclohexyl hexacosane	$C_{32}H_{64}$		448 5	.843[21]	...	86[21]	135[21]	446[21]	149[21]
Decahydro naphthalene	$C_{10}H_{18}$		138	.887*	...	.....	.....	.....	...
B octadecyl, decahydro naphthalene	$C_{28}H_{54}$		390 4	.869[21]	...	113[21]	148[21]	46 3[21]	144[21]
B duocosyl, decahydro naphthalene	$C_{32}H_{62}$		446 5	.873[21]	...	.....	208[21]	52[21]	148[21]
5-B decahydro, naphthil duocosane	$C_{32}H_{62}$		446.5	.868[21]	...	.....	252 5[21]	51 4[21]	114[21]
5 Duodecahydro, biphenyl duocosane	$C_{34}H_{66}$		474.5	.873[21]	...	.....	352[21]	57 5[21]	110[21]

UNSATURATED NAPHTHENE HYDROCARBONS

Hydrocarbon—	Formula	Molecular weight	Specific gravity 60/60	Boiling point °F.	Refractive index N_D^{20}
Methene cyclopropane	C_4H_6	54	....	52 5[10]	.....
Cyclopentene	C_5H_8	68.1	.777[10]	112[10]	1.421[10]
Methyl cyclopentene-2	C_6H_{10}	82.1	.769[10]	156 2[10]	1.413[10]
Methyl cyclopentene-3	C_6H_{10}	82.1	.776[10]	161.6[10]	1.427[10]
Ethyl cyclopentene	C_7H_{12}	96.1	.799[10]	226.4[10]	1.443[10]
1-1 Dimethyl cyclopentene-2	C_7H_{12}	96.1	.762[10]	172 4[10]	1.419[10]
1-2 Dimethyl cyclopentene-1	C_7H_{12}	96.1	.797[10]	217.4[10]	1.492[10]
1-1-2 Trimethyl cyclopentene-2	C_8H_{14}	110.1	.786[10]	226 4[10]	1 431[10]
1-2-3 Trimethyl cyclopentene-1	C_8H_{14}	110.1	.799[10]	156 2[10]	1.442[10]
1-1 Diethyl cyclopentene-2	C_9H_{16}	124.1	.811[10]	291.2[10]	1.446[10]
1-2 Diethyl cyclopentene-1	C_9H_{16}	124.1	.815	304.7[10]	1.452
1-3 Diethyl, 2 methyl cyclopentene-1	$C_{10}H_{18}$	138.1	.814[10]	327.2[10]	1.450[10]
1-2-3 Triethyl cyclopentene-1	$C_{11}H_{20}$	152 1	.817[10]	358.7[10]	1 451[10]
1-3 Dimethyl, 2-ethyl cyclopentene	C_9H_{16}	124.1	.806[10]	284[10]	1 447[10]
Methyl cyclohexene-1	C_7H_{12}	96 1	.811	231 8[10]	1.4496[10]
Methyl cyclohexene-2	C_7H_{12}	96.1	.802[10]	217[10]	.....
1-1 Dimethyl cyclohexene-3	C_8H_{14}	110 1	.8040[10]	242.6[10]	.....
1-2 Dimethyl cyclohexene-1	C_8H_{14}	110.1	.827[10]	276.8[10]	1.460[10]
1-2 Dimethyl cyclohexene-3	C_8H_{14}	110.1	.81[10]	255.2[10]	1.449[10]
1-3 Dimethyl cyclohexene-3	C_8H_{14}	110.1	.804[10]	257[10]	1.445[10]
1-3 Dimethyl cyclohexene-4	C_8H_{14}	110.1	.801[10]	258.8[10]	.....
1-4 Dimethyl cyclohexene-1	C_8H_{14}	110.1	.803[10]	262.4[10]	.....
1-Methyl, 4 methene cyclohexene	C_8H_{11}	110.1	.795[10]	251.6[10]	.....
1-3-5 Trimethyl cyclohexene-1	C_9H_{16}	124.1	.800[10]	285.8[10]	.....
1-2-5 Trimethyl cyclohexene-4	C_9H_{16}	124.1	.805[10]	293[10]	.....
1-2-4-5 Tetramethyl cyclohexene-4	$C_{10}H_{18}$	138 1	.817[10]	330 8[10]	.....
Cycloheptene	C_7H_{12}	96.1	.8407*[10]	239[10]	.....
Cycloheptadiene 1-3	C_7H_{10}	94.1	.884[10]	248[10]	.....
Cycloheptatriene 1-3-5	C_7H_8	92.1	.911[10]	240 8[10]	.....
Cyclopentadiene	C_5H_6	66.1	....	105.8[10]	.....

*Density 50/4.

POLYMERIZATION

(Continued from Page 32)

the proper size of polymerization unit that should be constructed to serve a certain area.

The estimation of natural gasoline reserve is on a well established basis, and it seems that the simplest procedure is to estimate the reserves of butane, propane and ethane on the basis of the reserve of natural gasoline. Figure 1 indicates the content of butane, propane and ethane respectively as a function of the butane-free natural gasoline content of the natural gas. This plot was prepared

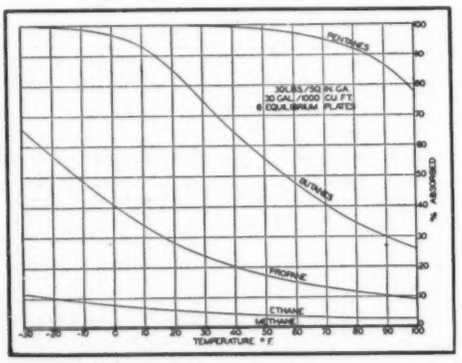


Fig. 4—Effect of temperature on per cent absorbed

from published analyses of natural gases (see legend) and indicates a range for each component within which the composition of most natural gases may be found.

By use of Figure 1 and a knowledge of the natural gasoline reserve, the reserves of butane, propane and ethane may be estimated within the indicated range.

As indicated, the content of butane, propane and ethane is in each case usually greater than that of the butane-free natural gasoline. Even gases known as dry gases may also contain appreciable quantities of propane as well as ethane.

The production of natural gasoline reported by the American Petroleum Institute to be 42,000,000 bbls. in 1936 if interpreted as barrels of 26-70 gasoline represents about 30,000,000 bbls. of pentanes and heavier or butane-free gasoline.

Using average values from Figure 1, about 45,000,000 bbls. total butane or 33,000,000 bbls. of extra butane over that now sold as natural, 66,000,000 bbls. of propane, and 66,000,000 bbls. of ethane are available for extraction in addition to the natural gasoline from the natural gas now being processed annually for natural gasoline. Complete extraction of butane, propane, and ethane and conversion to motor fuel at an assumed average volume yield of 35 per cent would result in 58,000,000 gallons of high-octane fuel. It is possible that a weighted average of the gases produced from various areas as indicated by legend would vary this quantity considerably.

The problems of extracting and transporting the products, however, will require considerable attention before this reserve is actually realized.

Changes in Natural Gasoline Plants

The demand for butane as feed for polymerization plants has already been felt by the natural gasoline manufacturer, who is now modifying his plant operation so as to recover increasing amounts of butane. It is expected that this demand for additional feed for the polymerizing units will soon be felt as an increased demand for propane. In order to obtain these more volatile components in the raw gasoline, the operation of an absorption plant can be varied in three ways; increasing the oil rate, increasing the pressure, or decreasing the temperature.

TABLE 2—ABSORPTION OF METHANE AT HIGH ABSORPTION CONDITIONS

Absorption at 400 lbs. ga., 75° F., 30 gal. per M cu. ft. Gas in a Six Equilibrium Plate Absorber

	Mol or vol. fraction original gas (9)	Per cent absorbed	Mol fraction raw-product
Methane	.7609	4.1	.200
Ethane	.1327	26.9	.222
Propane	.0628	79.	.308
Butanes	.0268	99.	.166
Pentanes plus	.0168	99.9	.104

Absorption at 400 lbs. ga., 75° F., 100 gal. per M cu. ft. Gas in a Six Equilibrium Plate Absorber

	Mol or vol. fraction original gas	Per cent absorbed	Mol fraction raw product
Methane	.7609	13.5	.326
Ethane	.1327	80.	.337
Propane	.0628	99.5	.198
Butanes	.0268	99.9	.085
Pentanes plus	.0168	100.	.054

Absorption at 400 lbs. ga., —30° F., 100 gal. per M cu. ft. Gas in a Six Equilibrium Plate Absorber

	Mol or vol. fraction original gas	Per cent absorbed	Mol fraction raw product
Methane	.7609	21.1	.412
Ethane	.1327	99.5	.326
Propane	.0628	99.9	.155
Butanes	.0268	100.	.066
Pentanes plus	.0168	100.	.042

The effect of increasing the oil rate is to increase the absorption of all components. This is indicated in Figure 2 in which the per cent of the individual component absorbed is plotted as a function of the oil rate in gallons per 1,000 cubic feet at a constant temperature of 75° F. and 30 pounds gauge with six equilibrium plates as calculated from published methods and data.[14 13 24 25 26]

It has been seen that the per cent of all components absorbed is increased as the oil rate is increased. In the case of those components such as pentane (and butane for high oil rate) which are 90 per cent or more absorbed, the increase in the oil rate has relatively less effect in increasing the percentage absorbed than of those components such as methane and ethane which are absorbed to only a slight degree. It is clear from this chart, Figure 2, that increasing the oil rate beyond certain limits so decreases the selectivity of the absorption that the composition of the raw gasoline begins to approach that of the gas itself. As this condition is approached, the utility of the absorption operation becomes steadily less.

By increasing the oil rate it appears possible to recover substantially all of the butane while maintaining the desired selectivity between the absorption of butane and less volatile components and the undesired ethane and methane. Although relatively large percentages of propane may be recovered by increasing the oil rate, the accompanying increase in absorption of methane and ethane indicates that this method will probably not prove generally satisfactory. In the case of ethane it does not appear feasible to recover it in an absorption operation because any condition which will absorb a relatively large percentage of ethane, will also cause the absorption of such large percentages of methane that the absorption process loses its utility as a means of recovering and retaining ethane. It is possible that operation at extremely low temperatures may in a large part overcome this loss in selectivity, but other methods appear more desirable if refrigeration is to be used.

The effect of operation at increased pressure is much the same as those operations conducted at increased oil rate, as indicated in Figure 3. The curves in Figure 3 have much the same shape as those in Figure 2 and again it is indicated that practically all the butane and less volatile material may be recovered by operating the absorber at an increased pressure. Also, very substantial recoveries of propane may be obtained without excessive absorption of methane and ethane.

The data given in Table 2 were computed from an Oklahoma City natural gas for operations conducted at 400 pounds pressure with 30 gallons per 1,000 feet oil rate and 100 gallons per 1,000 feet. Operating at these high pressures, substantially all of the butane and less volatile is recovered in each case. By increasing the oil rate from 30 gallons to 100 gallons per thousand, the recovery of propane may be increased from 79 per cent to about 99.5 per cent, but the accompanying increase in the recovery of ethane is from 27 to 80 per cent. In order to improve the recovery of propane from 79 to 99 or increase of something less than 50 per cent, the absorption of methane and of ethane is increased over 200 per cent in each case by increasing the oil rate from 30 to 100 gallons per thousand. When operating with 100 gallons per 1,000 feet, the raw liquid product is really a natural gas containing 2 gallons per thousand of butane-free natural as compared with the original gas supplied to the absorber which was a gas containing about .65 gallon per thousand.

Figure 4 is a plot indicating the effect of temperature on the per cent recovery of pentanes, butanes, propane, ethane, and methane when operating at 30 pounds gauge and 30 gallons per 1,000 feet with six equilibrium plates. It is clear that temperatures below —40 will be required if high percentages of propane are to be recovered by an absorption process at the indicated oil rate and pressure and a material increase in either of these factors cannot be made without also carrying undesirable percentages of methane and ethane. The calculated percentage absorbed and analysis of raw product when extracting the Oklahoma City gas at —30° F., 400 pounds gauge and oil rate of 100 gallons per 1,000 feet of gas are given in Table 2. It is evident that this product is a rich gas containing 1.7 gallons per 1,000 feet of butane-free natural gasoline.

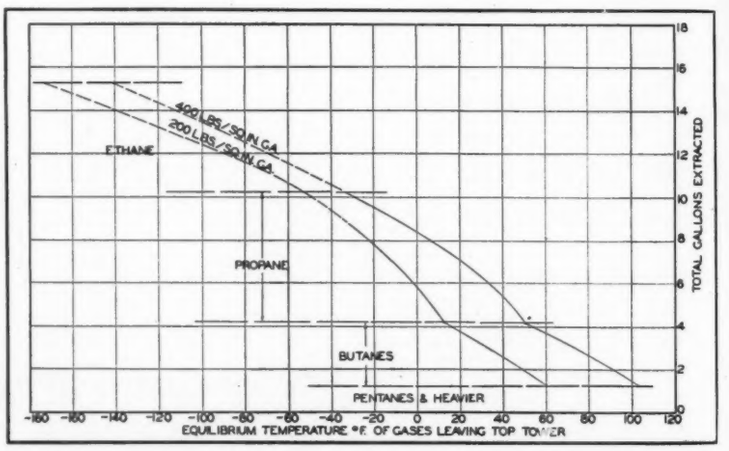


Fig. 5—Effect of temperature at top of tower on poly feed recovery

The conclusion from this study is that ordinary absorption plants operating at high or low pressure and at all ordinary temperature cannot successfully recover more than about 75 per cent of the propane in a satisfactory manner. In many cases, however, it is possible to recover substantially all of the

When "Dick" Richards comes in High Power Costs Go Out

SEND FOR A COPY OF OUR BULLETIN "ATLAS IMPERIAL DIESELS FOR ALL OIL FIELD SERVICE"

ATLAS IMPERIAL DIESEL ENGINE CO.

OAKLAND, CALIFORNIA · MATTOON, ILLINOIS

Oil Country Distributors

K. S. RICHARDS · WICHITA · OKLAHOMA CITY · FORT WORTH · HOUSTON

ATLAS IMPERIAL

butane by the use of the proper pressure and oil rate. . . . .

In such an operation it may be necessary to utilize refrigeration to obtain the low temperature at the top of the column necessary for adequate reflux, but it has been shown that these low temperatures are necessary if the same work is to be done in the oil absorber. It, therefore, would seem desirable to fractionate the gas directly under pressure and with the use of as low temperature as is necessary, thereby eliminating the absorption and stripping operation whenever possible.

The temperature at any pressure and for a definite extraction of a gas at which the unextracted gases leave a fractionator is easily calculated[14] because the gases must be at their dew point. Table 3 shows an example calculation for a column operating at 215 pounds abs. on East Texas gas with an extraction of 50 mol per cent of propane and 100 per cent butanes and less volatile. The calculation is a trial and error solution of equation.

$$\Sigma \frac{y}{K} = \Sigma x = 1$$

in which y = mol fraction of a constituent in vapor phase

x = mol fraction of the constituent in the equilibrium liquid phase

K = equilibrium constant [24 25 13]

As the unextracted gas must be the vapor phase and be in equilibrium with liquid at the top of the tower, the mol fractions of the unextracted gases in this mixture are the y's of equation. The K's may be obtained from charts at any temperature and pressure and so the correct condition may be found by trial so that the sum of the x's equals unity as the mol fractions of all constituents present must add up to one. The first trial at 215 pounds and —10° F. gave $\Sigma \frac{y}{K}$ or Σx equal to .9465 and so a temperature of —13° F. was chosen. The sum of .996 is close enough to unity in light of the previous 0.9465 to call the dew point of the methane, ethane, and propane mixture as 215 pounds abs. and —13° F. These conditions are those under which the gas is finally separated from the liquid at the top of the tower on a tray or in an accumulator drum.

The results of a series of such calculations based on the East Texas gas at 200- and 400-pound pressures are given by Figure 5. Rather low temperatures are required for high extraction of propane or ethane. For substantially complete extraction of ethane, substantially pure methane must be refluxed in order to have methane gas in equilibrium with a liquid. This condition is true regardless of the initial composition of the gas.

TABLE 3—EXAMPLE OF CALCULATION OF EQUILIBRIUM

Temperature of Gases Leaving Fractionator

	Composition of East Texas gas (17)		Composition of gas leaving top of tower for 50% extraction of propane and 100% butane plus	
	Mol fraction	Gal. per 1,000 cu. ft.	Mols	Mol fraction
Methane	.463	. .	.463	.599
Ethane	.202	5.1	.202	.261
Propane	.215	6.0	.108	.140
Butanes	.089	2.9	....	....
Pentanes and heavier	.031	1.3	....	....
Totals	1.000		.773	1.000

Dew Point of Gas Leaving Tower at 215 lbs. Abs.

Composition mol fraction	K at 215 lbs. abs. —10° F.	y / K	K at 215 lbs. abs. —13° F	y / K
Methane .599	9.0	.0665	8.0	.067
Ethane .261	0.96	.2721	0.92	.284
Propane .140	0.23	.608	0.218	.642
Totals		.9465		.996

Total gallons extracted = 1.3 + 2.9 + 3.0 = 7.2.

In case a gas like the Oklahoma City gas of Table 2 were to be fractionated to remove one-half of the butane and all the pentanes, a rather low top temperature on the fractionator is known to be required. The calculated temperature of +3° F. at 400 pounds gauge is too low to justify direct fractionation for the recovery of natural gasoline alone. In the cases of fractionation of gases high in methane content, it has been mentioned that an absorption preliminary step would assist but careful study of the problem shows that as the extraction is increased, the increase in the tower top temperature accomplished by this preliminary step becomes small.

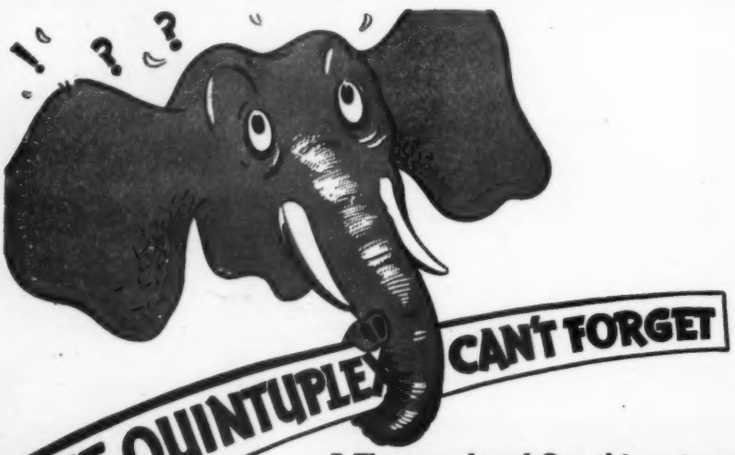
It should be understood that the top temperatures computed for the fractionation operation are all based on complete separation and the tower may require a very large number of plates to accomplish the indicated separation but may require a relatively small number of plates to approach this condition.

A comparison of top tower temperatures at 400 pounds gauge required for the East Texas and the Oklahoma City gases is given below:

Extraction—	Temperature of gases at top of tower: East Texas	Okla. City
100% ethane and less volatile	—142° F.	—142° F.
100% propane and less volatile	—33° F.	—75° F.
100% butane and less volatile	+50° F.	—15° F.

These differences in temperatures to which the gases must be cooled show that preliminary absorption steps are not feasible for cases of high extraction such as for propane and ethane.

The failure of the absorption process to separate

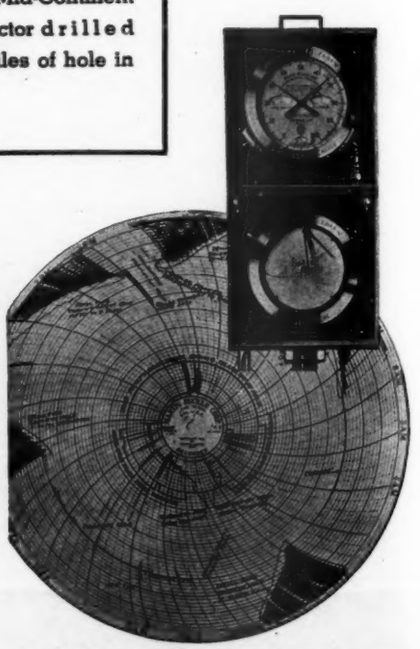


Do You Know?

One Mid-Continent contractor drilled 337 miles of hole in 1936.

A Thousand and One things to remember — mud pressure fluctuations — torque changes — weight variations — how long in the hole — how long on top . . . even an elephant couldn't remember all the things that happen around a rig in one day, but Quintuplex CAN'T forget! It keeps a constant check on the weight, torque, and mud pressure, writing down changes the instant they occur.

Furthermore, Quintuplex centralizes the five important drilling gauges — weight indicator, super-sensitive weight indicator, torque, mud pressure, and rotary table r.p.m. — right under the driller's eyes where they're easy to watch and easy to read, yet not in the way.



A file of Martin-Decker charts is a permanent record of drilling experience.

MARTIN-DECKER CORPORATION

LONG BEACH CALIFORNIA

San Joaquin Valley: A. F. McQUISTON, Bakersfield, California

Mid-Continent Distributor: REED ROLLER BIT COMPANY, Houston, Texas

ethane and methane readily and the fact that lean gases may be fractionated under almost the same conditions as rich gases both point in the direction of the ultimate adoption of low temperature fractionation as the extracting method or by the time that ethane has a reasonable market as poly feed.

TABLE 4—CALCULATED VAPOR PRESSURES OF BLENDED POLY FEED STOCK EXTRACTED FROM OKLAHOMA CITY GAS

Vapor Pressures of Indicated Blend of Natural Gasoline Plus Poly Feed

Product—	Vapor pressures at 100° F. in lbs. abs.
Pentanes and heavier	9.8
Butanes and heavier	40.8
Propane and heavier	135.
Ethane and heavier	450.

Vapor Pressures of Indicated Blend of Poly Feed and Crude Oil

Product—	Vapor pressures at 100° F. in lbs. abs.
Crude oil	*8.0
Crude oil plus butanes	12.5
Crude oil plus butanes and propane	43.
Crude oil plus butanes, propane and ethane	195.

Vapor Pressures of Indicated Blend of Poly Feed, Natural Gasoline

Product—	Vapor pressures at 100° F. in lbs. abs.
Crude oil	*8.0
Crude oil and pentanes plus	8.1
Crude oil and butane plus	12.4
Crude oil and propane plus	41.6
Crude oil and ethane plus	190.

Vapor Pressures of Poly Feed

Product—	Vapor pressures at 100° F. in lbs. abs.
Butanes	60.0
Butanes and propane	149.
Butanes, propane and ethane	500.

*Assumed V.P., mol wt. Oklahoma City crude taken as 200 and gas-oil ratio about 2,000 cu. ft. per bbl. crude.

The routing of poly feed stock in the same general direction as crude oils could be severely handicapped by unexpected transportation difficulties or by indifference to the needs on the part of transportation organizations. In case these handicaps arise, the logical outlet for poly feed stock is the construction of polymerizing units in conjunction with natural gasoline plants.

The disadvantages of such a program lie in the fact that most gasoline plants are considered as temporary as compared to refineries. The high investment of a poly unit in a temporary location would be undesirable. The resultant motor fuel still would have to be transported from the oil field to the market but tankcars would be quite suitable for the lower vapor-pressure product.

A consideration of present methods of estimating natural gasoline reserves will indicate that few gasoline plants are very temporary. The presence of sufficient quantities of crude oil and natural gas in most cases to operate a plant for from 5 to 7 years must be proven before a plant will be constructed. A 40,000-gallon per day (26-70) or 28,000-gallon butane-free plant extracting natural gasoline from Figure 1 should be able to furnish 90,000 gallons of C_4 and C_3 to a polymer gasoline unit besides the natural extraction. A 35 per cent yield of polymer gasoline from the complete C_4-C_5 fraction would result in 35,800 gallons of polymer gasoline, in addition to the 28,000 gallons of butane-free natural.

A blend of the two gasolines would make a product of about 12 pounds vapor pressure and of very high octane or a premium motor fuel at least during seasons of the year, and the volatility could be adjusted for all conditions. This fact is likely to be the motivating force for the construction of poly units in the producing field. A premium motor fuel product would make the natural gasoline producer independent of the refiner not only for poly feed but also for all the natural gasoline and would make tankcars the only means of transportation required. A move in this direction may not be economical at the present time but it would have a remarkable effect on the demand for the remainder of the natural gasoline and for butane.

References

[1]E. O. Bennett. Petroleum Eng. Vol. 7, No. 13, p. 135, (1936).

[2]L. G. E. Bignell, The Oil and Gas Journal, Sept. 24, p. 30, (1931).

[3]J. S. Carey. Ref. and Nat. Gas Mfgr. Vol. 15, No. 12, p. 549, (1936).

[4]M. B. Cooke, H. R. Swanson, and C. R. Wagner. The Oil and Gas Journal, p. 57, Nov. 14, (1935).

[5]Gustav Egloff, Nat. Pet. News, Vol. 27, No. 47, p. 25, (1935).

[6]A. L. Foster. Nat. Pet. News, p. 43, April 22, (1936).

[7]A. L. Foster. Nat. Pet. News, p. 43, April 22, (1936).

[8]F. E. Frey, The Oil and Gas Journal, Vol. 35, No. 34, p. 40, (1937).

[9]H. B. Hill, E. L. Rawlins, and C. R. Bapp, U. S. Bureau of Mines R. I. 3330, p. 211, (1937).

[10]V. N. Ipatieff and Gustav Egloff. Ref. and Nat. Gas Mfgr. Vol. 14, No. 6, p. 249 (1935).

[11]Ipatieff and Carson, Ind. Eng. Chem. 28, 860 (1936).

[12]Ipatieff and Pines. Ind. Eng. Chem. 28, 684 (1936).

[13]Katz and Hachmuth. 14th Midwest Regional Meeting of American Chemical Soc., Omaha, Neb. April 30, 1937.

[14]Katz and Brown, Ind. Eng. Chem. 25, 1373 (1933).

[15]P. C. Keith, Jr. and J. T. Ward. Ref. and Nat. Gas Mfgr. Vol. 14, No. 11, p. 506, (1935).

[16]B. E. Lindsly. Petroleum Eng. Vol. 7, No. 5, p. 34, (1936).

[17]F. H. Love. Petroleum Eng. Vol. 6, (7), p. 45, (1935). F. H. Love. Petroleum Eng. Vol. 7, (8), p. 26, (1936).

[18]F. H. Love. Petroleum Eng. Vol. 7, No. 9, p. 34, (1936).

[19]F. H. Love. Petroleum Eng. Vol. 7, No. 3, p. 27, (1935).

[20]F. H. Love. Petroleum Eng. Vol. 8, No. 3, p. 74, (1936).

[21]B. H. Sage and W. H. Lacey, The Oil and Gas Journal, Vol. 35, No. 26, p. 176, (1936). B. H. Sage and W. N. Lacey. Oil Weekly, Vol. 83, No. 10, p. 19, (1936). B. H. Sage and W. N. Lacey, 15th Am. Meeting A.P.I. No. 16, (1934).

[22]B. H. Sage and W. N. Lacey, Oil Weekly, Vol. 77, No. 10, p. 29, (1935). B. H. Sage and W. N. Lacey, The Oil and Gas Journal, Vol. 34, No. 1, p. 16, (1935).

[23]B. H. Sage and W. N. Lacey, The Oil and Gas Journal, Vol. 34, No. 27, p. 38, (1935).

[24]Sage, Lacey and Schaafsina, Ind. Eng. Chem. 26, 214, (1934).

[25]Souders, Selheimer and Brown, Ind. Eng. Chem. 24, 517, (1932).

[26]Souders and Brown, Ind. Eng. Chem. 24, 519, (1932).

[27]H. M. Trimble, The Oil and Gas Journal, p. 58, May 18, 1933.

[28]C. R. Wagner, Ind. Eng. Chem. 27, 933, (1935).

YOUR

PRIVATE TERMINAL

Do you need a seaport terminal for bulk liquids? One that would be strictly private and entirely your own? Wouldn't it be fine if someone else would build it and pay its entire operating expense? That is just what General American already has done. Our five strategically located terminals give you every advantage of your own private facilities . . . with no investment on your part. Here you will find modern, efficient facilities for any bulk liquid . . . and savings to you through careful handling, minimum evaporation, and lowest insurance rates. General American's five terminals are at your service.

GENERAL AMERICAN

TANK STORAGE TERMINALS

Can Handle Anything That Will Flow Through a Pipe Line

TERMINALS
Goodhope, La., Westwego, La.
Corpus Christi & Houston, Tex.
Carteret, N. J.

GATX GENERAL AMERICAN

OFFICE
135 South LaSalle Street
Chicago

A division of General American Transportation Corporation

PROBLEMS FROM READERS

Edited by L. G. E. Bignell

How to "Plug Back" a Hole

In a recent issue of The Oil and Gas Journal you describe the present status of a well in Venezuela as "suspended at 5,200 feet and the hole plugged back to 4,445 feet where it is standing idle." Would you kindly furnish the writer with a brief explanation of what constitutes "plugging back"?—D. B. H.

In reply to your inquiry of the twenty-seventh about "plugging back" the following is quoted from Uren's "Oil Field Development":

"If a well has been drilled through a productive sand and has encountered bottom water, or if a portion of the productive zone is partially flooded with edge water, it will be necessary to seal off the water by placing a cement plug in the bottom. . . . A somewhat similar operation must be accomplished in abandoning the lower portion of a well in order to produce from an upper horizon, or to redrill when the walls of the well have caved or departed from the vertical.

"The plugging of a well for either of these purposes may be accomplished by the dump bailer or tubing methods. The bailer method is used by preference when only a small quantity of cement is to be placed, otherwise the tubing method is resorted to.

"When tubing is employed, the well is tubed to a point near bottom and cement slurry is pumped or siphoned into the tubing. Mud fluid or water is then pumped in on top of cement until the tubing fills to the surface, indicating equilibrium in pressure conditions has been reached. The tubing is then raised to a point just above that selected for the upper end of the cement plug and circulation continued under pump pressure down through the tubing and back to the surface through the annular space between tubing and casing, or vice versa, until all of the excess cement is washed out. The tubing is then withdrawn. If necessary to hold pressure on the well, the tubing may be packed off at the surface by a packing head on the casing and pressure applied to either the tubing or the casing."

In direct answer to your question the well in Venezuela had been drilled to a total depth of 5,200 feet and for some reason it was decided not to drill it any deeper. It was then decided to "plug back" to 4,445 feet where it is possible the operators intend to test some formation which may be productive.

In this instance there is 755 feet of hole between the bottom of the well and the top of the plug. This is too much to fill with cement so it is quite probable the drilling contractor ordered some kind of an obstruction, known as a "bridge" placed in the hole at some distance below the point where the plug was to be run but still at some distance above the bottom of the hole.

A bridge may be formed in several ways but it is in reality a plug to fill the drilled hole and above this obstruction or plug cement is dumped or placed with tubing in sufficient quantity to fill the hole up to the desired level. This in effect gives the hole a new bottom several hundred feet above the point to which the hole was originally drilled.

Having created a new bottom for the well or "plugged back" the driller proceeds to treat the hole just as if it had originally been drilled to this shallower depth. This plugging back operation may be repeated any number of times. If the distance is short between plugs it is easier to fill the hole with cement without bothering with bridges. If the points to be tested are widely spaced then the bridge is used. Sufficient cement, say 200 feet, is used above the bridge to make the new well bottom tight and secure so it won't fall out or slip down the hole when fluid accumlates on top of it.

Drilling in Arizona

It has recently come to our attention indirectly that some company is wildcatting for oil in Chino Valley, Arizona. It is rumored the well has reached the depth of 1,500 feet and the oil-bearing sand is expected at approximately 2,000 feet. Do you have any report on such a wildcat?—W. D. R.

We do not have any report on a wildcat now drilling in Chino Valley, Arizona, except a private communication from Phoenix, Ariz., stating that it was observed from the highway in Chino Valley that an old derrick was apparently again in operation after a long period of idleness.

In Arizona Bureau of Mines, Oil Series No. 5, Bulletin No. 130, published by the University of Arizona, Tucson, Ariz., in March, 1931, it is stated that several holes have been drilled in Chino Valley north of Del Rio with negative results. One well drilled by the Chino Valley Oil & Mining Co., located in section 27-18n-2w, drilled in 1913, was carried to a total depth of 1,800 feet and a trace of oil was reported at the bottom of the hole. This valley is on the southwest edge of the plateau region.

This valley is alluvium-filled and extends from a point about 24 miles north of Prescott for a distance of 24 miles in a northwesterly direction and is flanked on the northeast side by lower Paleozoic sediments. At the southeast end, where Chino Creek joins the Verde River, and turns eastward, a deep cut has been made by the streams in Paleozoic beds, slightly petroliferous shales of probable Mississippian age have been exposed. No definite structure is exposed in the valley or on its sides. The beds lie uniformly, nearly flat, with a dip of from 0 to 10 degrees south.

Drill Stem Twist-Offs

Will you please advise me in which issue of The Oil and Gas Journal a short article on drill stem twist-offs was published? I believe it was sometime in 1934 but I cannot locate same.—B. C. C.

In checking the 1934 index we find reference to an article by the writer entitled "Some Drill Pipe Twist-Offs May Be Attributed to Long Column Failure." This was published in the November 29, 1934, issue of The Oil and Gas Journal and gives information about some of the twist-off problems and suggests remedy.

It is recognized there may be other reasons for twist-offs but it is hoped this reference is the one you desire.

Discovery Methods in East Texas

Will you kindly advise me the method used to discover the East Texas and Mexia oil fields, whether by geology, seismograph, or by divining rod and "dowsing"?—H. S. H.

The Mexia district was first explored for gas and the first drilling was done by Mexia Oil & Gas Co., which drilled 10 wells before a successful gasser was completed in 1912.

In 1915 both G. C. Matson and Frederick G. Clapp, geologists, were engaged in mapping the Mexia-Grosbeck area. Referring to the possibility of finding petroleum below the main gas "pay" (Nacatoch sand) at Mexia, Mr. Matson, in 1916, wrote the following:

If a well drilled to test the lower sands should prove unsuccessful above the Austin chalk, it might be well to continue to these deeper sands (Woodbine) in order to determine whether they are oil or gas bearing in the Mexia-Grosbeck field. In spite of the fact that these beds contain potable water at Corsicana, it is worth while to test them for oil and gas in the Mexia-Grosbeck field, where the structure is exceptionally favorable for the accumulation of oil and gas. The best place to locate a well to test the deep sands in the Mexia-Grosbeck field would be where the upper gas sand is high.

The discovery well in the Woodbine sand was drilled by Col. A. E. Humphreys with the advice of F. Julius Fohs, geologist, and was completed in October, 1920, as a 150-bbl. pumper making about 35 bbls. of water.

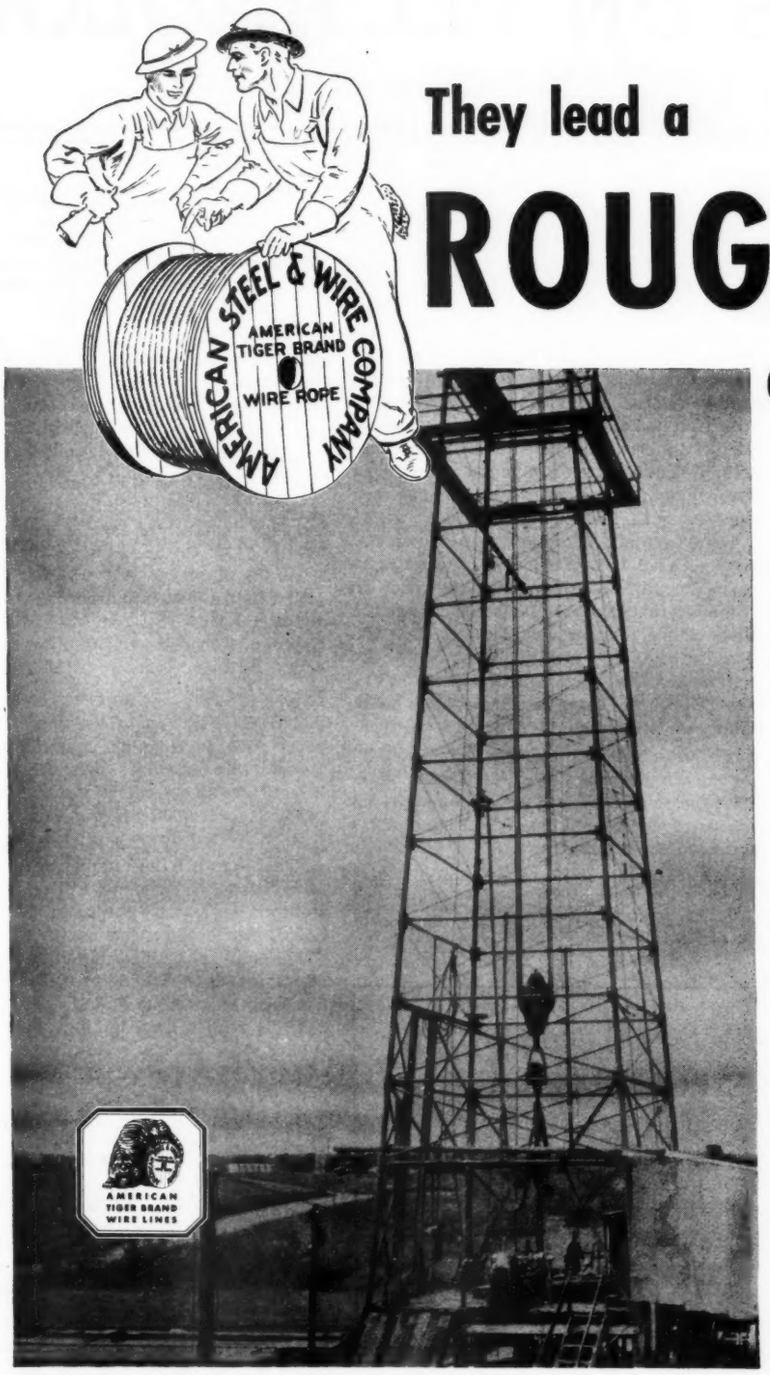
The East Texas oil field was opened by C. M. Joiner, who completed Mrs. Daisy Bradford No. 3 on September 8, 1930 at a total depth of 3,592 feet. Mr. Joiner did not have the benefit of geological advice in making this location.

Geologists had long recognized the possibility of an oil field somewhere in the vicinity of the area where the East Texas oil field was later discovered but it was not possible to locate this field by surface indications.

The discovery of the Woodbine sand in Mexia was distinctly due to applied geology. East Texas oil field was discovered by chance and in neither field did the divining rod play any part.

There are a lot of people now claiming to have known where these two fields were located before discovery but they never made these disclosures until after the fields were developed in spite of the many claims they now set forth to try to prove their claims.

There is no way to suppress the claims made by operators of divining rods and dowsers, but the fact remains, against all of their claims they did not act upon their superior knowledge before the oil fields were discovered which shows a very definite lack of faith in their ability to do what they claim. It will always be noted the operators of doodlebug outfits claim with their method and somebody else's money, not theirs, they can find gas or oil fields. Anyone can make similar claims without responsibility and spend someone's money and if they do not prove their claim they simply say they are sorry. These men never admit failures and we know they are not super-humans, and "To err is human, to forgive divine."



They lead a ROUGH LIFE and they're made to stand it

WIRE line economy is so dependent upon long life and trouble-free operation that it pays to use only lines made to stand rough wear. For trouble-free operation you need wire lines that stand up under terrific strains—that avoid whipping at high speeds.

Each of the many types of American Tiger Brand Wire Lines is made to definite specifications of strength, flexibility, and elasticity. Extreme care in production, backed by constant research and inspection, assures lasting service.

American Tiger Brand Wire Lines are available in Standard (non-preformed) or Excellay (preformed) constructions. Each type and size is made to serve its own particular purpose and will give you complete economy and dependability. Our engineers will gladly work with you to determine which type is best suited to your needs.

U·S·S AMERICAN TIGER BRAND WIRE LINES

AMERICAN STEEL & WIRE COMPANY
208 South La Salle Street, Chicago
Empire State Building, New York

COLUMBIA STEEL COMPANY
Russ Building, San Francisco
United States Steel Products Company, New York
Export Distributors

UNITED STATES STEEL

QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph.D., Technical Editor

Color of Oils Are Designated By Numbers As Approximations

When reporting color by the A.S.T.M. method, using the N.P.A. color instrument, if a sample is slightly darker than 2 but much nearer 2 than 2½, what would be reported? For a bright stock which is a shade different from the color disks, should depth of color be read or the color shade?—R. L. H.

The color of a lubricating oil is obtained under the A.S.T.M. procedure by selecting the glass color standard which most nearly matches the oil. When the color of the oil is found to be intermediate to two of the standards the result may be designated "plus" or "minus," or "lighter than." Therefore, when an oil is darker than 2 it may be reported as 2 or 2½ minus, or lighter than 2½.

Each color has three properties, designated color constants. These are: (1) Hue or tone, such as bluish red as distinguished from orange or yellowish red. (2) Value, which permits one to recognize a light red or a dark red; these are shades. (3) Purity, as a pure red differs from a yellowish red. A mixture of white paint and black paint may have a white tint or black shades. Shade expresses degree of color, as this green is a shade paler than grass green.

The color glasses of the oil colorimeter are made with various combinations so that the shades may be reported by numbers, thus avoiding the complications that would result if it were necessary to identify colors according to hue, value and purity.

The same system may be followed with heavy oils or oils having a color darker than No. 8, when it is necessary to dilute with 21 color kerosene. Exactly 15 per cent by volume of the oil and 85 per cent kerosene is mixed for this purpose. The color then reported as determined but followed by "Dil."

Influence of Moist Atmosphere on Knocking of Automobile Engine

Can you furnish any information showing what effect atmospheric moisture has upon the knock rating of gasoline? It is generally agreed that the motor operates with less knock, runs smoother, during a fog or rain, than when the air is dry, but I can find no reports of experiments on this.—R. E. F.

It has been recognized that detonation of the fuel in an automobile engine lessens with increase of the humidity of the air. One of the early reports on this subject came from the Technical High School of Breslan in 1932. These tests were made with air adjusted to moisture content by means of a built-in hygrometer, with a device for either decreasing (drying) or increasing the moisture content. When the relative humidity increased to 50 per cent or more the antiknock value of the fuels was raised, being especially marked for the fuels of low rating.

A recent report before the S.A.E. meeting in Detroit, January 11 to 15, 1937, showed similar results. The material following has been abstracted from this paper.

Two or more of the following types of fuel were used in each test: Straightrun, benzol-straightrun blend, cracked, leaded straightrun, and octane-heptane blend. Humidities were varied from 0.003 to 0.03 pound of water per pound of dry air. The straightrun, the cracked, and the benzol blend were similarly affected as to their knocking intensity by the changes in the absolute humidity. The higher the humidity the less intense the knocking. The octane-heptane blend was less influenced by humidity and the leaded fuel to a greater degree than the first-named fuels. The changes in absolute knock in terms of octane number for change in humidity from 0.002 to 0.023 pound of water per pound of dry air (equivalent to a change in water-vapor pressure of 1 inch of mercury) were as follows: Octane-heptane blend 5.1, straightrun 7.2, straightrun leaded 10.8, cracked 7.9, and straightrun benzol 7.9 units. A slight error, however, in mixing the reference fuel blends would change the equivalent octane number values materially. Experiments in varying the dry air pressure while the humidity was constant proved that change in dry air pressure does not alone account for the effect of humidity on detonation.

It has been suggested that variations in humidity may explain some of the wide differences reported for the octane value of the same fuel by individual operators. A humidity of 0.0135 pound has been proposed for standard use.

References: Schmidt and Seeber, Technical High School, Breslan, Influence of Humidity of Air in Knock Determinations, Erdol u. Teer 493, 1932 (Nov. 5). MacGregor, Standard Oil Co. of California, Influence of Humidity on Knock Ratings, S.A.E. An. Meeting, Detroit, 1937.

CHEMICALS FOR THE PETROLEUM INDUSTRY

Acetone

Use—Solvent for refining lubricating oils.

Form—Liquid, inflammable, slightly colored.

Formula—$CH_3.CO.CH_3$, dimethylketone.

Specific gravity	0.7962
Melting point	—202° F.
Boiling point	133° F.

LIMITATIONS

Distillation 95% vol. min. °F.	132.8-136.4
Endpoint, max. °F.	149.7
Evaporation residue from 50 ml. max.	2.0 mg.
Acid, cal. as CO_2, max. %	0.002
Alkalinity	nil
Aldehydes, max.	trace

When 0.5 ml. of a 0.1 N. solution of potassium permanganate is added to 100 ml. of the acetone sample and allowed to stand 15 minutes at 25° C., the pink color shall not be entirely discharged at the end of this time.

The iodometric determination shall show the equivalent of at least 99 per cent of pure acetone.

Reference: Federal Standard Stock Catalog O-A-51a.

Definition of Petroleum Naphtha

What is the meaning of naphtha as used in the petroleum industry? Does the word mean just one general liquid or are there several different liquids that may properly be called naphtha?—T. Y. E.

The petroleum refiner often uses the word naphtha to indicate an unrefined or raw distillate, which may be made up largely of the fractions to be included in finished gasoline. The American Society for Testing Materials gives this definition:

PETROLEUM NAPHTHA.—A generic term applied to refined, partly refined or unrefined petroleum products and liquid products of natural gas, not less than 10 per cent of which distills below 347° F. (175° C.) and not less than 95 per cent of which distills below 464° F. (240° C.), when subjected to distillation in accordance with the Standard Method of Test for Distillation of Gasoline, Naphtha, Kerosene, and Similar Petroleum Products (A.S.T.M. Designation: D 86) of the American Society for Testing Materials.

NOTE.—The "naphthas" used for specific purposes such as cleaning, manufacture of rubber, manufacture of paints and varnishes, etc., are made to conform to specifications which may require products of considerably greater volatility than that set by the limits of this generic definition.

There are a large number of special naphthas, as suggested in the note, utilized as diluents and solvents for various purposes. These may have a boiling range of from a few degrees up to about 200° F. and are refined to a high degree of purity. Examples—Stoddard Solvent, for cleaning, must not flash below 100° F. and distill 50 per cent at 350° F., with a final boiling point of 410° F. A rubber solvent is marketed distilling between 140° and 160° F., contains no sulfur and no weighable residue.

Reference: A.S.T.M. Standards on Petroleum Products, September, 1936, page 359.

Saybolt Ring Number of Kerosene

Will you kindly explain what is the meaning of "Ring Number" used in the report of a crude oil analysis, when describing the kerosene fraction?—R. E. T.

The Saybolt Ring Number is an empirical index of the smoke tendency of kerosene. No published description of the method for arriving at the number is available in the literature. It appears to have been derived by arranging certain data, such as gravity, viscosity, etc., in a formula. the resulting numbers, when checked by actual lamp tests were thought to be of value as indicating the burning quality of the oil.

While the ring number does occasionally appear in the reports of crude oil analyses, it is no longer considered to be so reliable as the more direct method of the Institution of Petroleum Technologists for measuring the smoke tendency of illumingating oils.

Questions on Petroleum Technology may be sent to Dr. Charles K. Francis, The Oil and Gas Journal, Tulsa, Okla. When a copy of the answer is desired postage should be enclosed.

FIELD OPERATIONS

Summarizing the Week's Developments

The first big well to have been drilled in the Illinois Coal Basin is Pure Oil Co. No. 1 Travis in Clay County, which flowed 1,200 bbls. in 10 hours Sunday night and Monday morning. It is producing from the 2,900-foot horizon. It was not yet completed and may be even a better well than the 10-hour preliminary test indicated. The drilling campaign in the basin has spread into Vigo County, Indiana, south of the city of Terre Haute, and two wells are going down and one about to start drilling.

OKLAHOMA

Two large producers one starting at 4,000 bbls. and the other 3,800 bbls. per day were completed in the Billings pool, Noble County, Oklahoma, one extending production a location southward. The second well to find pay in the Muse area, south of Fitts field, Pontotoc County, was showing as a larger producer than the discovery. A new producing area was opened in Kiowa County.

KANSAS

A wildcat that may connect the Silica, Ellinwood and Peter areas of Barton County, Kansas, was showing as a producer. Wildcat producers opened pools in Ellis and Rice counties. The third test to find oil in the Whelan pool, Barber County, is estimated at 1,700 bbls. per day, a larger producer than the previous wells.

GULF COAST FIELD

The world's deepest oil well, in Terrebonne Parish, Coastal Louisiana, is producing 37 bbls. per hour through a quarter-inch choke at a depth of 11,615 feet, plugged back depth, and is definitely a completed operation. The Big Lake distillate field in Cameron Parish was developed into an oil field with a 568-bbl. well, producing 38-gravity crude through a quarter-inch choke. The Vinton field in Calcasieu Parish was extended.

TEXAS

A discovery well in Fisher County, in West Central Texas, is estimated from 1,000 to 3,000 bbls. per day. It is about 2½ miles northeast of the city of Rotan, and is producing from a total depth of 3,505 feet. A new pool was opened in Clay County, and a deeper pay in Montague County. In Zavalla County, Southwest Texas, a new Edwards lime pool was opened by a well that flowed as high as 180 bbls. per hour on its first test. It is on the Gillam ranch, 6 miles southeast of the town of Batesville. A new pay sand was opened in the London field, Nueces County.

TEX-LA-ARK AREA

Only two wells were completed in the Rodessa field, one in Caddo Parish, Louisiana, and the other in the 12-mile extension of the field in Marion County, Texas. The new Lisbon development has taken many rotaries from the Rodessa area where only 43 wells are drilling on both sides of the state line.

MICHIGAN

The largest well yet drilled in the Buckeye field in Gladwin County, Michigan, was completed in the past week. It was given a potential rating of 3,504 bbls. per day. It is a half mile north and a quarter mile west of the Wicklund discovery well. A late order affecting the Buckeye field reduces the allowable production per well to 150 bbls. per day, plus 10 per cent.

Completions in All Fields

(Week Ending May 22, 1937)

	Oil	Gas	Dry	Total	1937 total comp. to date	1936 total comp. to date
N. Y., Pa., W. Va.	71	11	6	88	1,435	1,270
Ohio	3	7	5	15	373	118
Indiana	0	0	0	0	40	64
Kentucky	18	1	5	24	124	83
Illinois	1	0	0	1	25	19
Michigan	16	2	6	24	333	289
Kansas	42	2	16	60	875	582
Oklahoma	41	3	10	54	1,082	902
Texas:						
North Central Texas	31	0	21	52	1,055	1,061
West Texas	55	0	5	60	995	513
Texas Panhandle	11	4	0	15	257	269
East Texas	36	0	0	36	818	1,050
East Central Texas	17	1	0	18	253	108
East Texas Border	1	1	0	2	163	22
Gulf Coast Texas	20	1	4	25	532	427
Southwest Texas	33	4	19	56	1,287	1,077
Total Texas	204	11	49	264	5,360	4,527
North Louisiana	7	2	5	14	246	260
Gulf Coast Louisiana	13	0	2	15	190	148
Total Louisiana	20	2	7	29	436	408
Arkansas	0	0	2	2	51	38
Montana	3	1	2	6	53	62
Wyoming	1	0	1	2	37	32
Colorado	0	0	0	0	6	12
New Mexico	15	0	3	18	296	191
Utah	0	0	0	0	0	4
California	20	0	7	27	558	430
Total United States	455	40	119	614	11,084	9,031
Total previous week	500	65	116	681		
Difference	45	25	3	67		

Outstanding Fields—Highlights

(Week Ending May 22, 1937)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
Amelia	3	13	5	3,324	29	2,227
Hastings	5	11	1	880	174	13,227
Flour Bluff	0	8	2	360	47	4,220
Saxet	5	32	3	540	434	17,880
Lopez	0	4	2	768	332	8,380
East Texas	37	114	36	1,363	21,006	464,957
Talco	3	37	13	3,952	323	28,050
Ector County	18	92	8	6,401	410	20,010
Winkler County	30	66	11	12,455	1,229	43,060
OKLAHOMA						
Oklahoma City	2	15	....	.....	1,114	169,525
Fitts	8	56	7	3,517	733	89,225
Olympic	2	16	3	92	347	14,575
KANSAS						
Ellis County	6	37	5	4,061	98	7,395
Reno County	6	29	4	4,357	414	19,425
Russell County	10	57	7	5,677	678	31,020
Rice County	10	58	10	18,831	828	50,005
NEW MEXICO						
Lea County	18	107	15	3,517	2,154	112,180
LOUISIANA-TEXAS						
Rodessa, La.	2	12	1	200	374	50,593
Rodessa, Tex.	4	31	1	336	286	43,623
Lisbon, La.	6	19	1	834	20	4,820
MICHIGAN						
Buckeye	39	66	11	12,963	87	16,847

California Field Report

By
L. P. STOCKMAN

MUST BUILD FIELD STORAGE OR CURTAIL IN WILMINGTON

LOS ANGELES, Calif., May 24.—Daily production of the Wilmington field of Los Angeles Basin did not show any great fluctuation during the week despite the completion of eight wells, due primarily to the inability of purchasing companies to truck out and absorb a larger volume. Several operators have made arrangements to store current production, but this will only temporarily alleviate conditions in the Wilmington field. As the weeks pass, it becomes more evident that operators must formulate a curtailment program and restrict production to the quota assigned by the Central Committee of California Oil Producers under the supervision of Umpire J. R. Pemberton. Independent refiners, who have been purchasing a considerable part of current production for the past several weeks, are experiencing difficulty in disposing of refinery residuum because of its high sulfur content. Refiners with cracking units are purchasing sulfur-free residuum and, as a consequence, residuum resulting from processing Wilmington crude oil is accumulating at a rapid rate. This has already been reflected in decreased purchases of crude oil in the Wilmington field and will become a more important factor within a few weeks.

Operators have become cognizant of this fact and are making a concerted effort to induce one or more of the major buyers to provide the field with pipe line facilities and purchase current production. The larger companies are reluctant to purchase this high-sulfur crude, especially in view of the fact that operators have not reached an accord with respect to curtailment. The situation confronting operators in the Wilmington field is particularly significant in view of the advance of 15 cents per barrel in fuel oil announced by marketers during the current week. This advance in fuel oil and an increase of 30 cents per barrel in diesel oil for ships' bunkers became effective May 19 at all Pacific Coast points with the exception of Honolulu, Vancouver and Panama.

Wilmington Completions

Eight new wells, which showed an aggregate initial daily production of 2,771 bbls., were completed in the Wilmington field during the week and a check of drilling operations indicates the probability that companies in this field should average at least one per day for the next several weeks. Royalty Service Corp.'s field department experienced a busy week due to the completion of three wells and the starting of two more. The company's No. 4 Nelson, the largest completion listed during the week, was brought in flowing 1,005 bbls. of 17.9 gravity oil through an open line following completion at 3,541 feet. The company's No. 5 Community was finished flowing 170 bbls. of 17.8-gravity oil initially from 3,610 feet after the hole had been finished with a 7-inch combination string carrying 410 feet of perforated and which was cemented through perforations at 3,199 feet. No. 16-7-1 Wilmington was completed flowing 488 bbls. of 19.1-gravity oil per day from 3,609 feet. Sunrise Oil Co., composed of Japanese, completed No. 1 Wilmington pumping 172 bbls. of 17.4-gravity oil daily from 3,553 feet. This well was finished with a 6⅝-inch liner including 135 feet of perforated.

Union Pacific Railroad Co. resuming its aggressive exploitation program temporarily retarded by the rapid completion of new wells, has six new rigs erected and is either driving piles or starting construction on nine others. During the week the company completed No. 17 flowing 670 bbls. of 17.9-gravity oil per day from 3,523 feet. This well, flowing through a 36/64-inch bean, has 398 feet of perforated opposite the productive zone. It is expected to clean up and show substantially larger production after it has been on production for a few days. Godsford Oil Co. has completed No. 1-W flowing 457 bbls. of 18.2-gravity oil daily from 3,540 feet. Pacific Western Oil Co. No. 2 Patten, bottomed at 3,555 feet, was brought in flowing 553 bbls. of 17.6-gravity oil daily through a 35/64-inch bean. This well was finished with 993 feet of 8⅝-inch liner cemented through perforations at 2,889 feet and which carried perforations opposite the oil sand at 2,894-3,225 feet and at 3,254-3,555 feet. Premier Petroleum Corp. No. 3 Selegna was completed flowing 156 bbls. of 17.9 gravity oil daily from 3,500 feet after the hole had been finished with 330 feet of 6⅝-inch liner including 263 feet of perforated. General Petroleum Corp. No. 3 Ford, a deep test in the Wilmington field, is rotating at 5,096 feet and should pick up the deep zone originally cored in No. 1 Terminal within 10 days. The Ford lease is located very close to the apex of the structure, and consequently No. 3 Ford should prove a rather conclusive test.

El Segundo

Richfield Oil Corp. completed an excellent well in the El Segundo field of Los Angeles Basin a few days ago when No. 5 El Segundo was brought in flowing 1,440 bbls. of 27.3-gravity oil and 2,550,000 feet of gas per day from 7,513 feet. This well has shown a cut varying between 1 and 5 per cent, but is expected to clean up after it has been on production a few days longer. The company has spudded No. 1 Elsie, northwest of the center of the field and west of Ohio Oil Co.'s Gough lease. The latter company is abandoning No. 3 Gough, which blew out prematurely several weeks ago from 7,094 feet. The company was unable to fill a cavity found at approximately 2,000 feet, tending to confirm the prevailing belief that the gas, mud and water which appeared during the blowout was coming from the shallow Kitsinger dry gas zone.

The Texas Co. No. 2 Security, one location removed from No. 1 Security, largest producer in the field, has been bottomed in Schist at 7,359 feet and is being prepared for an early production test. This well cored approximately 21 feet of rich oil sand and should result in commercial production, although it is not likely to equal the initial outlet of No. 1 Security. Preparations are under way to drill a third well on the Security lease. Standard Oil Co. has reached 5,755 feet in No. 1 Refinery, northwest of The Texas Co. No. 1 Security, and should reach the basement within a fortnight. Standard's No. 1 Refinery is on fee acreage which comprises a part of the company's El Segundo refinery. If substantial production is secured the company may find it advantageous to demolish one or more of its reservoirs, which are in close proximity to the state highway and to the well being drilled.

Tideland Development

Governor Merriam of California has affixed his signature to Senate Bill No. 579, introduced by Senator Olson, and this measure will be used as the basis of developing tidelands immediately adjacent to the Huntington Beach field unless national legislation now pending is enacted to change the status of submerged tidelands. It is believed probable that two other bills dealing with the tideland problem will be enacted by the state legislature, but because of the emergency clause contained in the Olson bill they will not become operative. The Olson tideland measure provides for development of the tidelands by means of piers, groins, or islands in contrast with other pending legislation which provides for development from the uplands. A royalty of 30 per cent is called for on wells exceeding an average production of 200 bbls. per day and on wells under 200 bbls. a sliding scale of royalties is provided. The tidelands located immediately adjacent to Huntington Beach will be segregated into 11 parcels and awarded singularly to the highest bidder, but in the event that no bids are received the director of finance may again call for bids or may, with the consent of the governor, proceed to have the development done by the state either by contract or day labor.

Oxnard

El Rio Oil Co. focused the attention of operators on the Oxnard district of Ventura County a few days ago when its wildcat, a little over 2 miles east of Oxnard, blew mud, gas and a small quantity of 20-gravity crude oil over the crown block during a formation test. The company's wildcat in question was bottomed at 2,717 feet and with the formation tester at 2,622 feet and open seven minutes resulted in a recovery after the blow of 8½ stands of frothy mud, some gas and a little crude oil. It is approximately 2,500 feet west of a wildcat drilled by Vaca Oil Co., which encountered an oil so viscous that it could not

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	May 13		May 6			
	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Intercoastal-domestic:						
Diesel and gas oil	.....	.....	.....	.....	176,726	151,541
Gasoline	125,276	17,897	7,950	1,136	1,121,952	2,482,788
Kerosene	.....	.....	65,010	9,287	130,040	505,419
Foreign exports:						
Crude oil	165,888	23,698	185,460	26,494	4,906,721	3,439,154
Fuel oil	244,373	34,910	170,181	24,312	5,126,602	3,645,416
Diesel and gas oil	40,266	5,752	345,981	49,426	2,567,630	1,964,527
Gasoline	.....	.....	90,761	12,966	2,496,611	2,206,373
Kerosene	.....	.....	.....	.....	894,236	380,593
Other unfinished oil	112,346	16,049	.....	.....	402,700	13,375
Coastwise-domestic:						
Crude oil	100,108	14,301	.....	.....	2,318,408	2,562,931
Fuel oil	190,950	27,279	365,561	52,223	5,430,172	3,180,170
Diesel and gas oil	23,108	3,301	45,970	6,567	940,160	508,660
Gasoline	323,873	46,268	262,447	37,492	4,554,770	4,961,572
Kerosene	2,212	316	9,960	1,423	69,559	86,133

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic:						
Diesel and gas oil	.....	.....	.....	.....	152,932	
Gasoline	.....	.....	.....	.....	25,778	71,960
Asphalt	.....	.....	65,790	9,399	65,790	60,950
Lubricants	.....	.....	.....	.....	6,848	18,129
Foreign exports:						
Crude oil	.....	.....	150,045	21,435	1,057,394	1,115,528
Fuel oil	.....	.....	47,411	6,773	657,730	1,216,505
Diesel and gas oil	.....	.....	42,568	6,081	1,043,880	302,931
Gasoline	.....	.....	277,842	39,692	2,072,876	1,217,454
Kerosene	.....	.....	33,868	4,838	285,903	246,681
Lubricants	.....	.....	7,774	1,111	242,405	103,917
Coastwise-domestic:						
Fuel oil	62,831	8,976	76,291	10,899	2,153,878	2,923,412
Diesel and gas oil	29,609	4,230	36,212	5,173	263,129	231,077
Gasoline	198,480	28,354	81,475	11,639	1,663,576	1,929,692
Kerosene	.....	.....	18,797	2,685	66,108	58,932

be made to produce even with the injection of live steam. The gas shown by the El Rio Co. wildcat was rather surprising in view of the complete absence of gas in the Vaca Oil Co. test. The Vaca Oil Co. was organized by the John Hays Hammond interests following the discovery of a probable structure by Roderick Burnham and associates, who were exploring the district in search of a mineral deposit. The structure mapped by Rod Burnham was subjected to an electrical resistivity test and then rechecked a second time before drilling operations were undertaken. The two wells drilled by El Rio Oil Co. and Vaca Oil Co. have definitely proved the existence of crude in the Oxnard area and thus other structures in this district will now be subjected to exploration. The Oxnard district is off the main trend of production extending along the seacoast and the area now being tested is approximately 15 miles from the nearest production in the Ventura Avenue field. It is interesting to note that small production of high-gravity oil was developed a number of years ago in the Conejo region, approximately 15 miles due east of Oxnard. The accumulation in the latter area was small and consequently the shallow wells were later abandoned. The favorable results of the El Rio Oil Co. Oxnard wildcat may lead to additional exploration work in this section, as Richfield Oil Corp. recently took an option on a group of leases comprising approximately 5,000 acres west of Camarillo. This lease in the Las Rancho area was recently acquired by Graham-Loftus Oil Co.

Kettleman Hills

Standard Oil Co. and Kettleman North Dome Association, principal operators in the Kettleman North Dome field, now that they have drilled the necessary number of wells completely offsetting privately owned acreage outside of the unit plan of development, have settled down to normal development of acreage not subjected to abnormal drainage. As a consequence the former is running only five strings of tools and the latter eight. During the week Kenda completed No. 63-34-J in section 34-21-17, brought in flowing 2,560 bbls. of exceptionally clean 36.7 gravity oil and 4,220,000 feet of gas per day from 7,865 feet. No. 4-18-J, a deep test of the Kettleman North Dome Association, section 18-21-17, is rotating in a hard shale at 10,135 feet. This well is out on the north flank in extreme western end of the field, about 1 mile east and north of Union Oil Co. No. 1 Lillis-Welsh, a duster. Standard Oil Co. completed a small well in section 33-21-17, No. 38-33-J, at 7,975 feet. This well, finished with 420 feet of 7-inch liner carrying 186 feet of perforated and cemented through perforations at 7,784 feet, was brought in flowing 330 bbls. of 37.5-gravity oil and 10 bbls. of water per day.

Greeley-Ten Section

Shell Oil Co., discoverer of the Ten Section field of Kern County, and Standard Oil Co., discoverer of the Greeley field in Kern County, are proceeding with normal development of their respective leases on property of the Kern County Land Co. and, as might be anticipated, are severely curtailing production in conformity with the existing curtailment program. In the Rio Bravo district, Union Oil Co. is drilling in a promising wildcat, No. 1-34 Kern County Land, section 34-28-25, at 8,160 feet. At the time this wildcat was spudded in, the company's geological department expressed the belief the structure was one of the most promising wildcat ventures the company had undertaken for some time. From a study of the area the company anticipated a development similar to that found in the Greeley and Ten Section fields, where production of high gravity oil is obtained at approximately 8,000 feet. Union has about 1,500 acres under lease in this area immediately adjacent to the wildcat now being drilled. The company also has the 720-acre Lowe Farms lease northeast of Rosedale between the Fruitvale and Greeley fields and holds jointly with Superior Oil Co. leases in six sections of land aggregating 3,840 acres about 2 miles northeast of the Ten Section field. A joint test of the two companies in the latter area at 12,160 feet is the deepest hole drilled in California, and this wildcat, No. 8 Kern County Land in section 11-30-26, is still drilling.

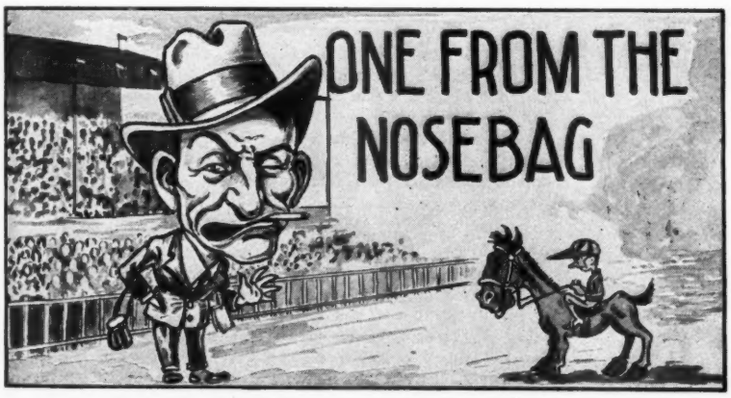
Round Mountain

Eastmont Oil Co. wildcat, which resulted in discovery of a new oil field east of the Round Mountain field in Kern County, is back on the beam pumping 302 bbls. of 16.9-gravity oil per day. The company has erected a rig for No. 2 Olcese in close proximity to the discovery well and drilling is expected to get under way immediately. Shell Oil Co. has staked location for a south line offset to the Eastmont Oil Co. discovery well and will proceed with immediate work. Shell's new well is No. 1 Olcese Estate, 196 feet south and 200 feet east of the center of section 16-28-29. Shell Oil Co. acquired its acreage in the vicinity of the Eastmont Oil Co. discovery more than a year ago. During the week Honolulu Oil Corp. completed No. 33 in section 18-28-29, brought in pumping 195 bbls. of relatively clean 15.8-gravity oil per day. The company bottomed No. 33 at 2,037 feet and finished the hole with 104 feet of 7-inch liner including 66 feet of 130-mesh screen. Shell's next completion in the Round Mountain field is expected to be No. 11 Olcese in section 17-28-29, as the water string was landed and cemented a few days ago at 1,896 feet. Shell No. 1-10 Olcese, completed last week pumping 481 bbls. per day, established a potential of 681 bbls. of exceptionally clean 16.9-gravity oil. In the Mount Poso field, Shell Oil Co. No. 32 Vedder, completed pumping 509 bbls. per day last week, has established a potential of 707 bbls. of clean 16.9 gravity oil.

Midway-Sunset

The Midway-Sunset field of Kern County continues one of the most active fields in the state at present, although recent completions have shown smaller production than heretofore. During the week Standard Oil Co. completed No. 125-33-D in section 33-32-24 pumping 192 bbls. of exceptionally clear 23.1-gravity oil per day. This well was bottomed at 2,720 feet and finished with 187 feet of 7-inch liner including 145 feet of 60 mesh. Shell Oil Co. No. 2 McKeon, section 22-32-23, has been completed pumping 309 bbls. per day from 2,117 feet, but a potential test will not be made until the well has cleaned up. In the meantime Shell has spudded No. 3 McKeon and picked up the pay at 1,806 feet. Honolulu Oil Corp. No. 54, section 14-32-24, has been completed flowing through casing at the rate of 545 bbls. per day. It was completed at 3,530 feet and finished with 406 feet of 4¾-inch liner including 71 feet of perforated. A number of wells are being started in the Midway-Sunset field, especially by Standard Oil Co. and Chanslor Canfield Midway

(Continued on Page 210)

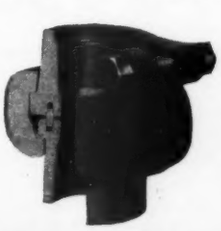


UNIBOLT

is a favorite that will give you

40 to 1

Cross Section of 6000-lb. Test Steel UNIBOLT



Because of its unique design, the High Pressure Steel UNIBOLT exerts approximately 40 pounds* of pressure on the seat for every pound of pressure applied to the bolt. The 9-degrees interlocking tapered shelves provide approximately 6½ to 1 multiplication of pressure applied to the bolt, and an equal multiplication results from the 9-degree taper on each side of the seal ring. Equal spacing of shelves assures equal pressure at all points on the seat.

* Less friction.

THORNHILL CRAVER CO.
Houston UNIBOLT **Texas**

THE name Layne, like the word "Sterling," permits no compromise with quality. Layne & Bowler, Inc., and their many affiliated companies, have the experience and equipment to efficiently solve all water problems. Everything from the original recommendation for the type of well, to the final drilling and pump installation is expertly handled by Layne technicians. No obligation is incurred by calling in a Layne Engineer.

Oil Refinery Executives may obtain complete information and illustrated literature by writing Layne & Bowler, Inc., Dept. O, Memphis, Tenn.

AFFILIATED COMPANIES

LAYNE-ARKANSAS CO. . STUTTGART, ARK.
LAYNE-ATLANTIC CO. . . . NORFOLK, VA.
LAYNE-CENTRAL CO. . . . MEMPHIS, TENN.
LAYNE-NORTHERN CO., MISHAWAKA, IND.
LAYNE-LOUISIANA CO., LAKE CHARLES, LA.
LAYNE-NEW YORK CO. . . NEW YORK CITY.
LAYNE-NORTHWEST CO., MILWAUKEE, WIS.
LAYNE-OHIO CO. . . . . COLUMBUS, OHIO.
LAYNE-TEXAS CO. . . . HOUSTON, TEXAS.
LAYNE-WESTERN CO. . KANSAS CITY, MO. CHICAGO, ILL., AND MINNEAPOLIS, MINN.
LAYNE-BOWLER NEW ENGLAND COMPANY, BOSTON . . . . . MASSACHUSETTS.
INTERNATIONAL WATER SUPPLY, LTD., PORT ERIE, N. . . . . ONTARIO, CANADA.

LAYNE PUMPS
LAYNE WELL WATER SYSTEMS

Central West

By STAFF CORRESPONDENT

PURE GETS FIRST BIG WELL IN NEW CLAY COUNTY FIELD

MATTOON, Ill., May 24.—The first big well in the development of the Illinois Coal Basin field is in the course of completion on Pure Oil Co.'s Travis lease in Clay County. It flowed 1,200 bbls. in 10 hours beginning last night. It is the company's No. 1 B. Travis, SW NW section 33-3n-8e. A drill stem test had been made at 2,943-68 feet earlier in the past week. There was a strong flow of gas for a short time followed by a 20-minute flow of oil into pits. Seven-inch pipe was run and the well was made ready for a preliminary test which was made Sunday evening lasting until Monday morning.

The 1,200-bbl. flow in 10 hours or at the rate of 2,880 bbls. per day may not be a true measure of the well's potentiality. That will be known later when the well is given a completion test. It may be a better than 2,800-bbl. producer. This well will add much to the interest being taken in the Illinois and Indiana Basin development and is expected to spur other big companies on to test out some of their acreage without further delay. The Carter Oil Co., one of the largest of lease holders, is starting its first operation on the Indiana side of the big play.

The invasion of Indiana by basin operators has been expected ever since the leasing campaign in Illinois started as several Indiana counties on the Illinois border were considered as a part of the basin area. Joe Schaffer and others were drilling at 1,060 feet, after finding a water stratum at 610 feet in their No. 1 Ben Beard, CWL NE SE section 33-11n-8w, about 10 miles southeast of Terre Haute. Hoffmeister, Ring and others were drilling at 874 feet in No. 1 Earl French, NE SE NE SE section 26-10n-9w, about 12 miles almost directly south of Terre Haute.

The Carter Oil Co., which pioneered the leasing campaign in Central Illinois and western Indiana, announced on Saturday the location of its first well in the basin. The location is on the Prairie Creek block, C S half SE NE section 16-10n-10w, in southwestern Vigo County, Indiana. The well will be drilled with a portable rotary outfit which was on the way to the location.

Marion County continues to be the most active spot in Illinois with a number of new operations started in the past week. Schlassburg & Sigel were ready to start spudding No. 1 in the SW SE SW section 20-2n-3e. Frank Frederick was moving in to start No. 1 Alton, CSL N half S half section 21-4n-1e. Adams Louisiana Oil Co. was moving in rotary at No. 6 Merryman, CWL SE SW section 21-4n-1e. Cypress Oil & Gas Co. was rigging up rotary at No. 1 Adams, C N half SW section 28-4n-1e. Hempen & Burgess were drilling at 703 feet in No. 1 Galliff, NE NW SE section 28-4n-1e, and drilling at 230 feet in No. 1 Jeff Smith, NW NW SE section 28-4n-1e. Adams Louisiana Oil Co. was drilling at 477 feet in No. 1 Anna L. Davidson, SW SW SE section 21-4n-1e. Eddinger, Baldwin & Parker were lowering 8-inch casing to 2,023 feet in No. 1 Nichols, SE SW SE section 12-4n-4e. Illinois National Oil Co. was considering running 8-inch casing at 945 feet in No. 1 City Lot No. 1 Patoka, NE cor. SW section 28-4n-1e. Adams Louisiana Oil Co. had three wells in Patoka field close to completion depth; No. 4 Glenn Merryman, SE SW section 21-4n-1e, had Benoist sand at 1,415-19 feet, total depth 1,421 feet, which was shot with 10 quarts of nitroglycerin. The hole filled with oil and cleaning out had begun. The same company's No. 5 Glenn Merryman, SW SW section 21-4n-1e, had Benoist sand at 1,392-1,413 feet. A 13-foot core recovered showed good saturation and the crew was swabbing. Same company's No. 1 Sam Pugh, NW NW section 29-4n-1e, had a showing of oil at 1,419 feet and was coring at 1,431 feet. These wells are all in the Patoka pool opened by the Adams Louisiana Oil Co. in Benoist sand, and are expected to make good producers.

Wiser Oil Co. was drilling at 1,260 feet in No. 1 Seth Martin, NW SE NW section 27-4n-1e. Hempen & Burgess were drilling at 860 feet in No. 1 W. W. Murfin, NW NW section 33-4n-1e.

Bond County

In Bond County Whitehead & Morey have started drilling No. 1 Polland, NW SE SW section 26-6n-2w.

Clinton County

In Clinton County Santa Fe Oil Co. No. 1 Robbin, SE SW SW section 5-1n-3w, was spudded. Timberlake and others drilled to 840 feet and shut down. No. 1 Bergman, SE NW SW section 8-1n-3w.

Ohio Oil Co. had 500 feet of oil in the hole from sand topped at 1,028 feet in No. 3 Trane, SW NE NW section 8-1n-3w, Clinton County, and continued drilling to 1,084 feet, where the well was shut down.

Perry County

J. H. Forester's deep test, No. 1 fee, S W half SW NW section 5-6s-1w, Perry County, was drilling at 4,886 feet.

Wayne County

Pure Oil Co. No. 1 Brach, NW SW SW section 26-1n-7e, Wayne County, was drilling at 2,930 feet, which is close to pay depth.

Pure Oil Co. No. 1 Stella Billington, SE SE NE section 27-1n-7e, was at a total depth of 3,212 feet. Two and one-half inch tubing was run to 3,126 feet and the hole circulated with oil. The tubing was then pulled and bailing developed a slight showing of salt water and later bailing at 3,131 feet brought up mud but no oil.

Pure Oil Co. was digging pits for No. 1 C. H. Billington, C SE SE SE section 27-1n-7e, and made a location for No. 1 Birkett, C NW NW NW section 35-1n-7e.

Lawrence County

Warren Hastings spudded No. 1 Weger, C N half SW section 29-5n-10w, Lawrence County, and was drilling at 1,411 feet in No. 1 Christensen, SE cor. SW SW section 11-3n-12w.

Jefferson County

Dee & Carter No. 1 J. H. Hamilton, SW NW section 20-4s-3e, Jefferson County, was drilling at 2,597 feet.

OHIO DEVELOPMENTS

There was a decided decrease in completed operations in the Ohio field this past week, but many new locations have been staked and activity continues on the increase. Several small producers were among this past week's completions and several tests made good showings of oil.

Bishop & Patton completed No. 7 Jane Hirst, section 2, Franklin Township, Licking County, as a 3-bbl. well in sand at 732-40 feet. In the same county, section 17, Hanover Township, Pure Oil Co. No. 5 Benson Nethers made a good show of oil in the Clinton sand at 3,212-53 feet and will be shot. In section 1, Licking Township, Wehrle Gas Co. is spudding on the Frank Woolard property.

Steri Brown & Co. No. 3 Allen Rine, in section 14, Clay Township, Knox County, made a show of oil at 753-60 feet and will be shot. In section 18, Butler Township, Ohio Fuel Gas Co. staked a location on the Jasper Royman property.

Ohio Fuel Gas Co. completed a commercial gas well on the George Ley farm, in section 3, Ripley Township, Holmes County, in Clinton sand at 3,372-81 feet.

Summit County

In Summit County, section 33, Green Township, East Ohio Gas Co. on the J. Reifsynder property has a commercial gas well that gauged 942,000 feet of gas from Clinton sand at 4,187-4,208 feet. In section 31, same township, R. C. Witwer is moving in a rig on his own property. In section 33, East Ohio Gas Co. is completing the test on the C. E. McCafferty farm. The same company is rigged up on the Shook & Wagner lease to deepen the test on that lease from the Newburg to the Clinton sand.

In Wayne County, section 4, Congress Township, Harmon & George are spudding on the John P. Hewey property.

East Ohio Gas Co. is completing the second test on the C. H. Rudy property in section 9, Jackson Township, Stark County. In section 24, Perry Township, Lyons & Co. are rigged up on the J. Burger property.

Bowler Oil & Gas Corp. No. 2 Joseph and Della Earnhart, section 24, Benton Township, Hocking County, was drilled through Clinton sand at 2,512-20 feet, through a 4-foot shale break into the sand again at 2,524-33 feet without a show of oil or gas when drilled in. After the well had stood open all night a show of a few gallons of oil was made and the test was shot with 60 quarts of glycerin. The shot failed to increase the oil but well made 2,623 feet of gas. The operators will probably abandon the test.

In Gallia County, section 29, Greenfield Township, Southern Ohio Development Co.'s test on the John Myers property, reported as abandoned, was later plugged back to the Gordon sand at 1,455-68 feet and made 92,000 feet of gas after a shot of 40 quarts.

Burt & Son No. 9 Susan Minor, in Location 1,097, Windsor Township, Morgan County, which made a show of oil in the Peeker sand at 445-88 feet and was shot into water, is making 3 bbls. every 24 hours since the water was exhausted.

Washington County

In Washington County, section 27, Liberty Township, Best Run Oil & Gas Co. No. 2 Anthony Schwartz was drilled through the first Germantown sand at 849-977 feet, and gauged 150,700 feet of gas after a shot of 60 quarts. In section 27, Independence Township, J. C. Herlan & Co. No. 2 John Eddy made a show of oil in the Peeker sand at 802-47 feet and 50,000 feet of gas in the Salt sand at 954-68 feet. The gas volume blew down over night and the well has been abandoned. In section 13, Warren Township, McVey Oil & Gas Co. No. 1 John Arnold, was unable to recover the tools from 1,700 feet and has been abandoned. In section 29, Wesley Township, O. K. Parrett No. 7 A. A. Goddard made a good show of oil in the Maxsburg 300-foot sand at 598-623 feet and will be shot.

In Athens County, fraction 18, Ames Township, D. T. Orndoff abandoned the test on the Emmett Linscott property. It made 20,000 feet of gas naturally from the second Berea sand at 1,430-41 feet but a shot of 20 quarts failed to increase the volume. In fraction 12, Lee Township, Albany Gas Co. abandoned a test on the Ray Bailes lease. The Stray sand at 358-460 feet showed no oil or gas. In section 12, Lodi Township, C. W. Nuzum is rigged up on the Perry Judson property. In section 17, same township, Ohio Fuel Gas Co. staked a location on the Floyd Hartley farm.

In section 9, Jefferson Township, Noble County, William Patton No. 9 Raymond Lincicomb made a show

(Continued on Page 210)

RED BALL CUTTING SERVICE

At the Head of the Table in Our Business

The RED BALL Cutting Service has consistently cut and recovered more pipe than all other cutting services combined in the territory where we operate.

J. S. Abercrombie Co.
21st FLOOR GULF BLDG.
HOUSTON - TEXAS

Among Gulf Coast Drilling Contractors

A new rig has been purchased by the Rudel Drilling Co. of Houston, and moved to the Midway field in San Patricio County for the Phillips Petroleum Co. The Rudel Drilling Co. was recently formed by Pat R. Rutherford, president of the Rutherford Drilling Co., which is operating three rigs in Matagorda County, and R. J. Delahoussaye and C. U. Roberts. Rutherford Drilling Co. is preparing to make a second test of United North & South Development Co. No. 1 Stoddard after it showed salt water when tested through perforated casing at 9,769½-81 feet. The well is scheduled to be tested below 9,800 feet and if this fails it will probably be drilled below 10,000 feet.

The South Central Drilling Co. of Shreveport recently completed two wells in the Eunice area for Superior Oil Co., and has moved one rig to the Jennings-Heywood lease in the Old Jennings field, Acadia Parish, for the Superior Oil Co. This particular section of this old dome has become one of the most active fields in the Louisiana Coast as a result of new sand discoveries made the past year.

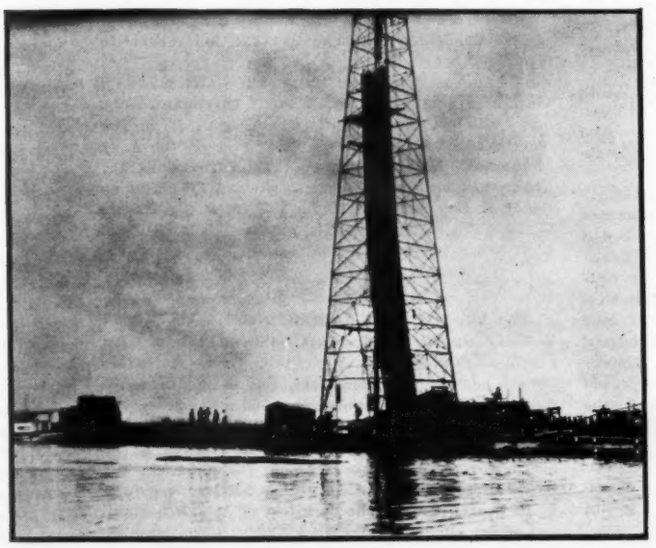
Ben (Bud) Coyle completed two additional wells for the Herton Oil Co. at the Jeanerette field in St. Mary Parish and received contract for another well. No. 6 Carter flowed 769 bbls. per day from sand below 7,000 feet while No. 8 Banta flowed 869 bbls. per day from a screen setting made at 6,639-60 feet, the total depth. Contract was received for No. 2 Roanes. No. 1 Banta-Roanes is drilling in shale below 8,307 feet.

With the recompletion of Humble Oil & Refining Co. No. 1 Ellender for the world's deepest producer and the blowout of Texas Co. No. 1 Bayou Sale in St. Mary Parish from a total depth of 12,261 feet, deep drilling along the Gulf Coast has passed the experimental stage and contractors operating throughout this district will be called upon to drill to greater and greater depths. The showing made by these two wells together with the developed production at Lafitte in Jefferson Parish, the Old Ocean field in Brazoria County below 10,000 feet and the showing of oil and gas in another wildcat at 12,216 feet in Vermilion Parish, is expected to result in an increase in deeper drilling throughout the Gulf Coast district.

Cron & Gracey, who marked up an extension for the St. Martinsville field in St. Martin Parish for the Tide Water Oil Co., received contract for a second test and the rig is being moved in. In the meantime, gas sand showing tremendous pressure has been encountered in Barnsdall Oil Co. No. 2 Edwards near Rockport in Aransas County and the well is drilling ahead below 7,900 feet. One workover job at the Iowa field resulted in a nice producer for the Shell Petroleum Corp. Other operations are reported at Manvel, Dickinson, South Houston and Flour Bluff fields for the Humble Oil & Refining Co., Stanolind Oil & Gas Co. and the Texas Co.

Loffland Brothers have reached the sand on three wells in the West

(Continued on Page 199)

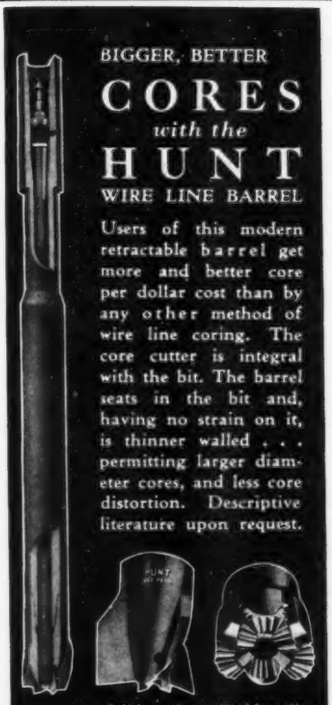


Texas Co. No. 1 Bayou Sale in southern St. Mary Parish which was drilled with contract right to the second greatest depth, having reached a depth of 12,261 feet. At this depth the well blew out, caught fire and burned for one hour before the hole bridged over. As the rotary rig and derrick were destroyed, the well will probably be abandoned. The rotary was mounted on wood foundations of 3x12 feet

Standco
NO-SMOKE
STANDCO BRAKE LINING
Nothing novel—no bunk—but it gets the job done without scoring brake rims. See page 1636, Composite Catalog.
STANDARD BRAKE LINING CO.

BIGGER, BETTER
CORES
with the
HUNT
WIRE LINE BARREL

Users of this modern retractable barrel get more and better core per dollar cost than by any other method of wire line coring. The core cutter is integral with the bit. The barrel seats in the bit and, having no strain on it, is thinner walled . . . permitting larger diameter cores, and less core distortion. Descriptive literature upon request.



Soft formation core head
Hard formation core head

HUNT TOOL COMPANY
HUNT WIRE LINE CORE BARRELS

BIT SERVICE SHOPS:
Houston, Joinerville, Talco, Corpus Christi, Bay City, Alvin, Texas . . . . Rodessa, Jennings, Houma, Louisiana.

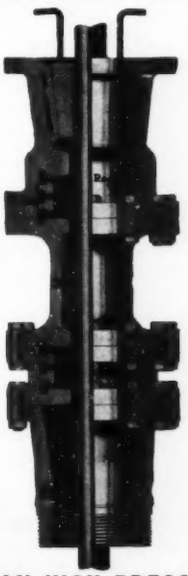
REED'S
'B-R'
DRILLING BIT WITH
WIRE LINE RETRACTABLE
CORE BARREL

ANY NUMBER OF CORES CAN BE TAKEN (REGARDLESS OF DEPTH) WITHOUT REMOVING THE DRILL PIPE

REED 'B-R' Drill Collar and 3-Blade Drilling Bit with Core Barrel in position

HARD FORMATION HEAD
(INTERCHANGEABLE WITH SOFT FORMATION HEAD)

REED
ROLLER BIT CO.



REGAN HIGH-PRESSURE OIL SAVER

For inserting or pulling tubing or casing under pressure. Controlled entirely by the well pressure, it requires no other actuating means. Available for all sizes of tubing or casing from 2" to 11¾". *Ask for Bulletin.*

Regan
Forge & Engineering Co.
Plant and General Offices: San Pedro, Cal. P. O. Box 150
Mid-Continent Office: 1502 Maury St., Houston; Oklahoma: Mid-Co Tool & Supply Co., Oklahoma City; Kansas Rep.: Bovaird Supply Co., Wichita; New York City Office: 17 Battery, G. R. Woods, Mgr.

Eastern Field Report

TWO ORISKANY TESTS DRY; 105-BARREL WELL IN LICKING

By STAFF CORRESPONDENT

PITTSBURGH, Pa., May 24.—Two important deep tests in West Virginia reached the Oriskany sand and are dry. In Calhoun County, Godfrey L. Cabot, Inc., is drilling through the Oriskany on the Allen Hardman farm in Center district and has found no gas or oil. The top of the Corniferous lime was at 5,984 feet and the top of the Oriskany sand at 6,191 feet. The Oriskany was coarse to 6,196 feet and contained a small amount of salt water and then the sand tightened and was very hard. It is at present drilling at 6,205 feet.

This test is located on the Arches Fork anticline about 3 miles west of Grantsville and just west of Bee Creek. It is on the west flank of the anticline, the axis of which passes through Grantsville.

In Hancock County, the test of John T. Galey on the Rachel Talbott farm in Grant district also reached the Oriskany sand and it was void of gas. The corrected top of the Corniferous lime was at 4,732 feet with the top of the Oriskany sand at 4,957 feet. About 3½ feet in the sand there was a showing of dark oil which was just enough to make the sand pumpings greasy. About 12 feet in the sand there was a small amount of water. The test is now drilling through the sand with an increase reported in the amount of water. The sand was very hard.

With reference to Bench Mark 1337, 1½ miles south of Chester, W. Va., this test is located exactly 1.7 miles south 55 degrees west and has a surface elevation of 1,270 feet. It is about 14 miles southwest of Galey and others Oriskany gas well on the William Graham (Calvin) farm in South Beaver Township, Beaver County.

Twenty-five operations were completed in the lower eastern fields during the past week of which five were dry holes, 10 gas wells, and 10 producers with an initial daily production of 355 bbls. There was one good producer in Southwest Pennsylvania and one in Southeast Ohio.

SOUTHEAST OHIO

The best completion for the week in Southeast Ohio was in Licking County, where the Pure Oil Co. completed No. 5 Amy F. Nethers farm in NE quarter section 17, Hanover Township, in the Clinton sand at a depth of 3,264 feet. It produced 105 bbls. the first day after shot.

In Hopewell Township of this county, Allen Willey and others completed a test on the Curry and Caldwell lease in SE quarter of section 24, in the Clinton sand at a depth of 2,985 feet. It produced 25 bbls. by swabbing the first day after shot.

In Medina County, Curtis & Eaken completed No. 18 Thomas Brown, Jr., farm, Tract 16, Lot 22, Chatham Township, in the Berea grit at a depth of 390 feet. It produced 1 bbl. the first day after shot.

In Morgan County, the Cumberland Oil Co. completed No. 40 on the H. S. Hopkins farm 1½ miles west of Chesterhill in Fraction 18, Marion Township. It was drilled in the First Cow Run sand and is good for a 1-bbl. pumper. A mile west of Dale, Lot 1097 in Windsor Township, G. E. Morris and others completed a second test on the W. E. and Daisy L. Harker farm in the Peeker sand and it is a 1-bbl. pumper at a depth of 496 feet.

In Knox County, J. B. Nopell and others completed No. 3 on the Alfred Rine farm in section 14, Clay Township, in the Berea sand at a depth of 706 feet. It will make a 2-bbl. pumper.

SOUTHWEST PENNSYLVANIA

Another fair producer was completed in Southwest Pennsylvania and it has the appearance of bettering the record of the Iams well of the previous week. In South Franklin Township, Washington County, the Carnegie Natural Gas Co. completed No. 2 Dr. C. T. Dodd farm in the Fifth sand and it is rated good for 200 bbls. a day initially. The Fifth sand was at 3,029 feet, with gas and oil at 3,131 feet, and oil at 3,035 feet. The total depth was 3,038 feet. It is located on the Point Lookout Fifth sand streak.

In Greene County, on Cook Run in Springhill Township, the Union Gasoline & Oil Corp. completed No. 7 Strope at a depth of 3,405 feet and it is good for 5 bbls. a day. The Gordon sand was at 3,375 feet with oil at 3,400-3,404 feet. In this township, Dunn Mar Oil & Gas Co. is drilling at 3,328 feet on No. 2 Kuhn heirs. The Northeastern Oil & Gas Co. shut down for casing at 1,700 feet on the J. W. McNichols test.

In Richhill Township, the Natural Gas Co. of West Virginia is drilling at 2,380 feet on the J. S. Johnson farm and at 2,290 feet and fishing for tools on the O. M. Grinnage farm. The Manufacturers Light & Heat Co. is drilling at 2,135 feet on the Ward Chambers farm with the top of the Injun sand at 1,905 feet and 176,000 feet of gas at 1,955 feet.

In Center Township, Greene County, Charles Mong and others have reached 2,890 feet on the J. L. Metz lease. The South Penn Oil Co. is building the rig for the Samuel Harvey No. 11. In Whitely and Perry Townships, the Peoples Natural Gas Co. began deepening No. 2,143 on the Taylor Fox farm at 2,836 feet and has reached 3,050 feet. In Aleppo Township, John G. Cochran is down 1,140 feet in No. 3 John Strope. In Wayne Township, H. D. Freeland is underreaming at 1,660 feet in No. 3 D. L. Freeland.

In Washington County, the Carnegie Natural Gas Co. has started drilling the test on the S. W. Bails farm in South Strabane Township. Here Victor D. Behm and others have started drilling on the Lucy Smith farm.

In Peters Township, Washington County, R. M. Duden and others are drilling the second test on the Johnson farm. Henderson & Co. are drilling at 1,545 feet on the Bell heirs farm. William Smith and others are down 900 feet on the W. Donaldson farm.

In Mount Pleasant Township, Potts Brothers & Co. have reached 1,550 feet on the Joseph Cowden farm. There was 200,000 feet of gas at 1,270 feet. The Dempsey Oil Co. is down 2,100 feet on the John Seabright farm.

In Amwell Township, the Union Gasoline & Oil Corp. is drilling at 630 feet on the A. O. Vankirk No. 6 and 2,930 feet deepening the No. 1, same farm. The South Penn Oil Co. is down 1,800 feet on the J. Q. Zimmerman farm. In South Franklin Township, the Union Gasoline & Oil Corp. has reached 1,608 feet on the H. L. Day farm. The Dunn Mar Oil & Gas Co. are in the Fifth sand in the No. 2 on the J. T. Baldwin farm and it will make a producer.

Deep Tests

The deep test of the American Natural Gas Co. and T. W. Phillips Gas & Oil Co. on the Perry S. Davis farm a mile south of Prospect in Franklin Township, Butler County, although showing some gas in the Oriskany sand, was plugged as a noncommercial well.

In Lawrence County, the Carnegie Natural Gas Co. spudded in and started drilling the test on the W. A. Currie farm in Shenango Township but at 89 feet lost the 13-inch bit in the hole and it is now being fished.

In Beaver County, the deep test of A. J. Wise, Jr., and others on the Beaver Falls Airport Corp. lease in South Beaver Township is now drilling in the Corniferous lime. The top of the lime was at 4,605 feet with the flint showing at 4,618 feet, and the tools are 60 feet in that formation. John T. Galey and others are changing engines in the deep test on the Minnie Weigle Heirs (Duff) farm and the tools have not been recovered at 4,300 feet.

In Washington County, the deep test of Norwood Johnston and others on the James McBurney farm in Mount Pleasant Township is still at the same depth with the tools unrecovered. The hole is gassing some from the last blowout and has bridged.

In Westmoreland County, the test of the Potter Development Co. on the Indiana Savings Bank lease (Kern Didge No. 1) in Fairfield Township is drilling at 7,510 feet. The dark shale was at 7,425 feet and it changed to very dark at 7,450 feet.

WEST VIRGINIA

Two oil wells were completed in West Virginia and several fair gas wells. In Calhoun County, Gerald D. Jones completed the test on the H. H. Bennington farm in Washington district at a depth of 2,197 feet, with 119,000 feet of gas at 2,146 and 2,153-2,184 feet. After being shut in three days, it made a flow of oil and is estimated at 12 bbls. a day.

In Ritchie County, the National Compressor Co. deepened the No. 4 on the John Lynch farm in Grant district to 2,071 feet, the Injun sand, and it is showing for 3 bbls. a day along with 50,000 feet of gas.

Gas Wells

The largest gas well of the week in West Virginia was the test of the McCall Drilling Co. on the Lloyd F. Wolf farm in Glenville Independent district, Gilmer County. It was drilled in the Big Injun sand, total depth 1,439 feet, and gauged 11,600,00 feet a day with a shut-in pressure of 505 pounds. The gas has been turned into the lines.

In the same district, the Pittsburgh & West Virginia Gas Co. completed a test on the Genevieve E. King farm in Big Injun sand at a depth of 1,552 feet. It is a gas well gauging 482,000 feet a day.

In Boone County, the Owens Illinois Gas Co. completed a test on the Ila White, Guardian, lease in Washington district as a gas well, total depth 1,735 feet. The gauge is 960,000 feet a day from the Big lime at 1,097-1,142 feet and 260,352 from the Berea sand at 1,700-09 feet.

In Cabell County, W. C. Kingery and others completed a test on the H. O. Aleshire farm in Guyandotte district as a gas well gauging 1,125,000 feet a day; Brown shale at 2,542-2,963 feet, with the gas at 2,555-2,565 feet. In McComas district; the Smith Creek Gas Co. and others completed a test on the Joseph Childers farm at 3,805 feet as a gas well gauging 154,224 feet a day.

In Clay County, the Hope Natural Gas Co. completed No. 7,766 on the Mary Wetherell farm in Pleasant district at a depth of 2,546 feet and it is a gas well gauging 50,000 feet a day.

In Ritchie County, the South Penn Oil Co. completed No. 20 Haught Lambert, in Murphy district, in the Injun sand at 2,119 feet. It is a gas well gauging 122,000 feet a day. In Clay district, W. D. Gribble completed No. 4 on the Leonard Heirs farm in the Injun sand at 1,813 feet. It is a gas well gauging 400,000 feet a day along with 1½ bbls. of oil. In Murphy district, W. H. Mossor drilled a test on the H. W. Britton farm through the Injun sand to 1,878 feet and it was dry.

In Wood County, L. C. Powell and others drilled a test on the Cyrus Pugh farm in Williams district through the Cow Run sand to 873 feet and it was a dry hole.

Oriskany Gas Fields

There were several new locations for tests in the Oriskany gas fields in Kanawha County. The most notable is in Poca district, by Godfrey L. Cabot, Inc., on the J. T. Bonham farm, 2 miles west of its drilling

(Continued on Page 198)

Kansas Developments

By
DAL DALRYMPLE

OPEN NEW PRODUCING AREA; MAY EXTEND SILICA TO WEST

Several new wildcat tests are being started in Kansas, many older wildcats are nearing decisions with some already showing as probable pool openers, two outposts were completed as producers and potential test had been made at another test that was not completed. Intensive activity in the proven areas continues unabated, several large producers were completed the past week and total production, now at 197,550 bbls. of oil daily, may pass 200,000 bbls. at any time.

Sixty wells were completed in the central and western fields, including 42 oil wells, two gassers and 16 failures. Offsetting these were first reports of 74 new operations, a gain of 14 for the week. In addition, numerous wells are being drilled, with several completions each week, in the stripper and shoestring areas of the eastern counties.

C. L. Price No. 1 Kraft, SW NW NE section 10-17-11w, wildcat pool opener northwest of the Bloomer pool in Barton County, pumped 1,890 bbls. of high-gravity oil in 24 hours from Siliceous lime, but it had not been completed. Five other Barton County wildcats were abandoned during the week.

A probable connection between the Silica and Ellinwood fields was seen at Stanolind Oil & Gas Co. No. 1 Kowalsky, NW NW NE section 11-20-11w, Barton County, reported to have pumped 115 bbls. of oil in 55 minutes from Siliceous lime. It is about 1¼ miles west of Silica production, about 1½ miles east of Ellinwood and a similar distance north of the Peter pool, and apparently proves a considerable area for development.

Empire Oil & Refining Co. No. 2 Bender-A, SE NE NW section 25-15-14w, Trapp field extensioner, swabbed 649 bbls. of oil in eight hours, but 24-hour test was delayed for pumping equipment and tankage. It opens to development the area between the Trapp and Ochs pools.

The third oil well in the Whelan pool of Barber County was near completion. It was Olson Drilling Co. and Vaccars Corp. No. 1 Whelan, SW NW section 29-31-11w, which flowed 240 bbls. of oil in three hours from Chat at 4,302-16 feet. It was shut in for tankage.

Rice County

Empire Oil & Refining Co. No. 1 Bredfeldt, C N half N half SW section 7-18-9w, wildcat, opened a new producing area in Rice County. It topped Siliceous lime at 3,223 feet, total depth 3,240 feet, and pumped 110 bbls. of oil in 10½ hours. It was acidized and made potential of 267 bbls.

In the Hauschild-Saxman-Theede district, Reserve Development Co. No. 4 Patton, SE NW NW section 16-21-7w, had Conglomerate at 3,375-81 feet, total depth, flowed 955 bbls. of oil in six hours and made potential of 3,619 bbls. Atlantic Refining Co. No. 1 Hopkins, SE SE SW section 6-21-7w, topped Conglomerate at 3,334 feet, total depth 3,343 feet, flowed 345 bbls. of oil in three hours, making potential of 2,050 bbls. Derby Oil Co. No. 7 Thode, SW SE SE section 8-21-7w, pumped 309 bbls. of oil in six hours and made potential of 1,171 bbls. from Conglomerate found at 3,357 feet, total depth 3,379 feet. Garden & Haines Oil Co. No. 2 Gossman, NW SE NW section 9-21-7w, topped Conglomerate at 3,359 feet, was bottomed at 3,374 feet and made potential of 1,925 bbls.

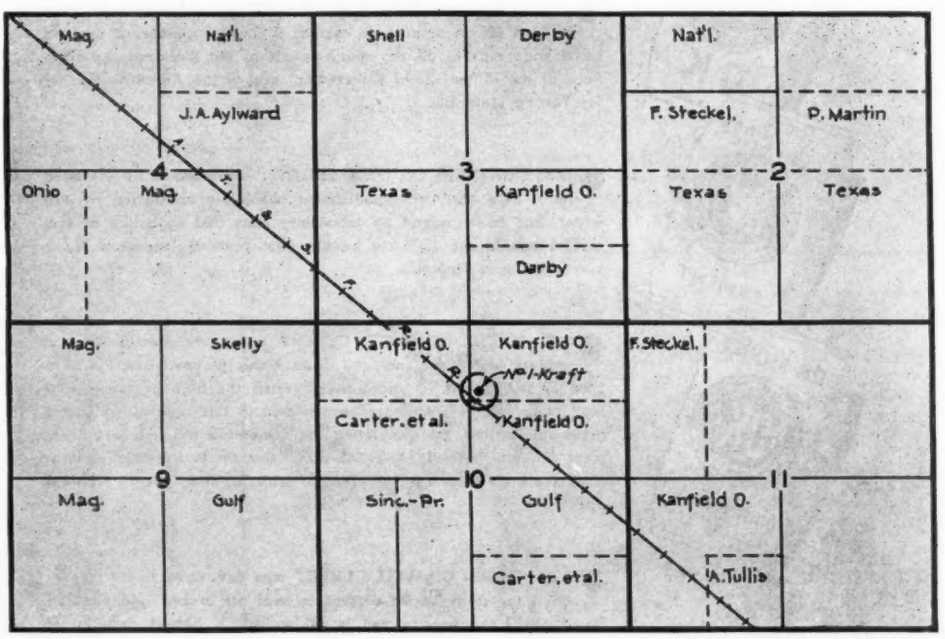
Sunflower Oil Co. No. 2 Stange, NE SW NW section 16-21-7w, set the pace for the district with a potential of 6,023 bbls. It found Conglomerate at 3,377 feet and was bottomed at 3,385 feet.

H. V. Holland and others No. 1 Brothers, SE cor. section 12-21-7w, wildcat, was an abandoned location.

Stanolind Oil & Gas Co. No. 4 Panning, SW SW NW section 33-19-10w, had Siliceous lime at 3,276-82 feet, total depth, and made potential of 2,382 bbls. Texas Co. No. 7 Kleile, SW SE SW section 34-19-10w, made potential of 2,362 bbls. of oil after acidizing Siliceous lime topped at 3,314 feet, total depth 3,326 feet. Sinclair Prairie Oil Co. No. 1 Knop, NE NE NW section 4-20-10w, had Siliceous lime at 3,317 feet, was bottomed at 3,336 feet, pumped 27 bbls. of oil and pumped off; acidized and made potential of 248 bbls.

Continental Oil Co. No. 1 Wood, NW NW SE section 12-18-8w, made potential of 1,729 bbls. of oil in 24 hours from Siliceous lime topped at 3,217 feet, total depth 3,225 feet.

Rice County operations reported for the first time were as follows: Phillips Petroleum Co. No. 1 Bolton, SW SW NE section 31-18-7w, cellar; Dick Sage and others No. 6 Gossman, SE NW NW section 9-21-7w, cellar; Reserve Development Co. No. 6 Patton, SW NE NW section 16-21-7w, cellar; Sunflower Oil Co. No. 3 Stange, SE SW NW section 16-21-7w, cellar; R. E. Day and others No. 1 Mansz, SW SE SE section 21-21-7w, an old well being deepened, drilling at 2,410 feet; Skelly Oil Co. No. 5 Dittmers, NW SW SW section 28-19-10w, building rotary rig; Republic Natural Gas Co. No. 7 Wendell, SE NE SE section 32-19-10w, cellar; Stanolind Oil & Gas Co. No. 1 Hathaway, NW NW SW section 33-19-10w, building rotary rig; Gulf Oil Corp. No. 2 Poncin, SW SW NE section 5-20-10w, rig; same company's No. 3 Poncin, NE SW NE section 5-20-10w, cellar; Transwestern Oil Co. and others No. 2 Clair, NW SE NW section 4-18-10w, building rig.



Mid-Continent Map Co., Wichita.

C. L. Price and others have opened a new Barton County producing area at No. 1 Kraft, section 10-17-11w

Russell County

Derby Oil Co. and Reserve Petroleum Co. No. 7 Michaelis, SW SE NW section 31-15-13w, Trapp field, Russell County, topped Siliceous lime at 3,262 feet, was bottomed at 3,267 feet, acidized, pumped 1,407 bbls. of oil in 12 hours, making potential of 2,814 bbls.

Gulf Oil Corp. No. 1 Hoffman, NE NE SW section 31-15-13w, found Siliceous lime at 3,237 feet, total depth 3,246 feet, swabbed 354 bbls. of oil in six hours; acidized, pumped 831 bbls. in 12 hours and made potential of 1,662 bbls. Carter Oil Co. No. 4 Detrich, NW SW SW section 8-15-13w, pumped 472 bbls. of oil in seven hours from Siliceous lime topped at 3,183 feet, total depth 3,188 feet, and made potential of 1,570 bbls.

Stanolind Oil & Gas Co. No. 3 Dortland, NW NE SE section 5-14-15w, found Kansas City lime at 3,040 feet, was bottomed at 3,095 feet, acidized and made potential of 591 bbls. of oil, with 3 per cent water.

Transwestern Oil Co. No. 1 Katharina Polcyn, NW cor. section 14-14-15w, had Gorham sand at 3,254-56 feet, total depth, and made potential of 1,197 bbls. of oil, with some water. Darby Petroleum Corp. No. 1 Dumler E, NE SE NW section 36-14-15w, had Siliceous lime at 3,199 feet, water at 3,200 feet, was bottomed at 3,201 feet and was dry and abandoned. Central Petroleum Co. No. 5 Foster B, NE SE NE section 3-14-15w, found Kansas City lime at 3,040 feet, total depth 3,070 feet, and made potential of 1,152 bbls. Same company's No. 3 Deckert, SW NE NW section 30-12-15w, had Kansas City lime at 3,032 feet, total depth 3,085 feet, was acidized and made potential of 504 bbls. of oil.

New work in Russell County: Stanolind Oil & Gas Co. No. 34 Mermis, SW SE NE section 5-14-15w, cellar; Central Petroleum Co. No. 12 Foster B, SE NE NE section 3-14-15w, moving in material; Texas Co. No. 3 Dumler, NW NE SE section 1-14-15w, building rig; Skelly Oil Co. No. 4 Dumler, SW SE NE section 1-14-15w, moving in material; Kirk & Jones and Phillips Petroleum Co. No. 1 Brown, NW NE SW section 6-14-14w, building rig; Carter Oil Co. No. 1 Josephine, SE cor. section 7-15-13w, old well, rigging up to deepen; same company's No. 2 Josephine, NE SE SE section 7-15-13w, location; same company's No. 5 Detrich, C N half S half SW section 8-15-13w, location; Sinclair Prairie Oil Co. and others No. 3 Sellars, NE NW NW sec-

tion 36-15-13w, cellar; Coralena Oil Co. No. 1 Deines, NE cor. section 36-15-14w, rigging up rotary. W. I. Southern, Inc. No. 6 Boomhower A, NW SW NE section 30-15-13w, drilling at 1,000 feet; same operators' No. 9 Michaelis, SW NW NW section 13-15-13w, rotary rig; Gulf Oil Corp. Nos. 6 and 7 Michaelis, SE SE SW and SE NE SW section 32-15-13w, building rigs.

Barton County

Wildcat fatalities in Barton County totaled five the past week. C. L. Carlock No. 1 Ehly, NE NE SE section 5-18-11w, wildcat, topped Kansas City at 3,050 feet, Conglomerate 3,308 feet, total depth 3,397½ feet, plugged back to 3,368 feet, acidized, pumped one-fourth barrel of oil and one-half barrel of water an hour and was dry and abandoned.

Vickers Petroleum Co. and others No. 1 Leibel, SE NE SE section 18-18-11w, wildcat, found anhydrite at 681 feet, Topeka 2,700 feet, Kansas City 3,108 feet, Conglomerate 3,385 feet, Simpson 3,465 feet, and was dry and abandoned at 3,469 feet, total depth.

C. H. Weaver and others No. 1 Stumps, NE cor. section 3-17-12w, wildcat, topped anhydrite at 748 feet, Kansas City 3,075 feet, Conglomerate 3,347 feet, Siliceous 3,365 feet, total depth 3,383 feet and was dry and abandoned.

Continental Oil Co. No. 1 Lematsch, SW NE NE section 26-17-12w, wildcat, was dry and abandoned at 3,405 feet, total depth. Top of anhydrite was 720 feet; Conglomerate 3,336 feet, Kansas City 3,072 feet, Siliceous 3,369 feet.

Stanolind Oil & Gas Co. No. 1 Meggars, SW cor. section 21-20-11w, wildcat, had water at 3,373 feet, total depth, with no oil showing, and was dry and abandoned.

Some good producers were completed in proven areas of Barton County. Indian Territory Illuminating Oil Co. No. 3 Peter, SE SE NW section 24-20-11w, topped Siliceous lime at 3,238 feet, was bottomed at 3,250 feet, and made potential of 1,604 bbls. of oil in 23 hours.

Ohio Oil Co. No. 1 Kramer, SW SW SE section 9-16-13w, found Siliceous lime at 3,375 feet, total depth 2,579 feet, and made potential of 303 bbls. of oil. It was acidized and made new potential of 320 bbls. of oil, with 190 bbls. of water.

In the Bloomer field, Spencer & Yarnell's well in NW NE SE section 36-17-11w, made potential of 2,714 bbls. of oil from Siliceous lime at 3,242 feet, total depth 3,246 feet.

Morgan & Flynn and others No. 1 Arnold, NW cor. section 30-18-15w, had sand at 3,504 feet, total depth 3,536 feet, made potential of 18 bbls. of oil, with 3,500,000 feet of gas.

C. B. Davis and Gulf Oil Corp. No. 8 Steckel, NE NE SE section 1-20-11w, had Siliceous lime at 3,272-78 feet, total depth, was treated with acid and pumped 380 bbls. of oil in 24 hours; reacidized, making potential of 982 bbls. of oil.

Harris & Haun and others No. 2 Haas, NW NW SW section 30-18-15w, topped La Motte sand at 3,500 feet, had a hole full of water at 3,536-40 feet, and was bottomed at 3,559 feet. It swabbed 2½ bbls. of oil and 22½ bbls. of water an hour and was abandoned.

New work in Barton County: Spencer & Yarnell No. 3-K Patzner A, NW NE SE section 36-17-11w, an old well, bottomed at 3,030 feet, was acidized and flowed 1,275 bbls. of oil in six hours; same operators' No. 6 Patzner A, SE SW SE section 36-17-11w, spudded; Polk & Fortson No. 1 Meyers, NW NW SE section 16-16-12w, cellar; Gulf Oil Corp. No. 1 Axman, NW NW SE section 23-17-15w, wildcat, building rotary rig; Ohio Oil Co. No. 2 Kramer, C W half W half SE section 9-16-13w, location.

For ALL USES IN THE OIL FIELDS

● O.K. STANDARD PORTLAND CEMENT is used wherever there is need for an all-purpose cement of highest quality. It exceeds by a wide margin all the requirements of the Standard Specifications of the United States Government and of the American Society for Testing Materials.

● O.K. LIGHTNING OIL-WELL CEMENT, developed to fill the need for a high early strength cement absolutely unaffected by salt water, has been proved by laboratory tests and by years of successful use in the field, to be the best possible insurance for a successful cementing job.

● O.K. SLO-SET OIL-WELL CEMENT meets the demand for a product which will not set while being pumped into wells of 5000 to 10,000 feet. It successfully resists the high pressures and high temperatures sometimes encountered in this type of well, and gives ample time for completing the cementing job before the cement stiffens. O.K. SLO-SET OIL-WELL Cement is sulphate-resistant and meets the most exacting requirements for this type of oil field cementing.

● O.K. FIBERED OIL-WELL CEMENT was developed to fill the demand for a hydraulic cement to seal off broken and fissured formations when encountered in oil wells. A fibrous material is mixed uniformly in the cement in manufacturing. When the fibered cement mixture starts to enter a crack or fissure in the formation, the fibers spread across and seal it, preventing entrance and loss of slurry into the broken formation.

● O.K. SUPERFINE MASONRY CEMENT is manufactured from the same raw materials as O.K. Portland Cement. It is unexcelled for mortar with proper sand, for laying up brick, block, tile, terra cotta, stone, and all masonry. It makes a plastic and easy working, highly adhesive mortar, extremely durable and very economical because of ease in handling and great cohesion. It combats efflorescence and is water repellant, shedding moisture and preventing water penetration of mortar.

OKLAHOMA PORTLAND CEMENT COMPANY
PERRINE BUILDING, OKLAHOMA CITY, OKLA.

ARKANSAS PORTLAND CEMENT COMPANY
WALLACE BLDG., LITTLE ROCK, ARK.

Estimated Daily Production

Estimated daily average production of Kansas for the week ending May 22, and for the preceding week, was as follows:

	Barrels	
	May 22	May 15
Oxford City	1,400	2,100
Burrton	14,100	16,300
Ritz-Canton	5,100	5,475
Graber	2,825	3,225
Hollow-Nikkel	2,475	3,675
Lerado	3,050	1,925
Voshell	2,700	2,900
Wellington	2,700	3,325
Ellsworth County:		
Lorraine	4,650	5,675
Other pools	1,770	1,395
Rice-Barton counties:		
Bloomer	5,025	4,625
Chase	8,975	8,350
Geneseo	1,600	2,025
Raymond	2,275	2,325
Silica	21,450	21,000
Keesling	2,225	1,975
Hauschild	5,100	4,075
Miscellaneous Rice	8,380	8,820
Miscellaneous Barton	4,710	5,335
Russell County:		
Fairport	2,495	2,110
Gorham-E. Gorham	3,230	3,445
Russell	2,495	2,650
Sullivan	8,455	8,415
Trapp	7,655	8,500
Miscellaneous Russell	6,690	6,215
Sedgwick County:		
Valley Center	1,160	1,140
Miscellaneous	3,315	2,635
Ellis County:		
Bemis	4,150	4,125
Miscellaneous Ellis	3,245	2,120
Kingman County	970	745
Stafford County	3,460	3,125
Greenwood County	9,700	9,600
Butler County	16,050	16,100
Other fields	23,970	23,025
Total Kansas	197,550	198,475

Ellis County

A new producing area was opened in Ellis County at Ted Kors and others No. 1 Koblitz, SE SW NW section 23-12-18w, wildcat. It topped anhydrite at 1,410 feet, Topeka 3,160 feet, Kansas City 3,445 feet, had a showing of oil at 3,445-54 feet, base Kansas City at 3,640 feet, topped Siliceous lime at 3,675 feet, pay at 3,694-98 feet and was bottomed at 3,699 feet. After acid treatment failed to increase oil showing, it was plugged back to 3,697½ feet, shot and acidized again. It pumped 13 bbls. of oil and pumped off, then pumped 210 bbls. of oil in 24 hours and later made potential of 250 bbls.

Lario Oil & Gas Co. No. 1 Walter C, NW SW SE section 2-12-18w, had Siliceous lime at 3,648 feet, total depth 3,655 feet, swabbed 102 bbls. of oil in two and one-half hours, making potential of 1,415 bbls.

Sinclair Prairie Oil Co. No. 1 Romine, SW cor. section 7-11-16w, made potential of 960 bbls. of oil from Siliceous lime topped at 3,305 feet, total depth 3,314 feet.

Margay Oil Co. No. 2 Bemis C, SW NE SW section 22-11-17w, had Siliceous lime at 3,486-89 feet, total depth, and made potential of 2,383 bbls. of oil.

Darby Petroleum Corp. No. 1 Solomon, NW NW NE section 33-11-19w, had Siliceous lime at 3,626-31

feet, total depth, and made potential of 603 bbls. of oil in 22 hours. Later, it made potential of 655 bbls. of oil in 24 hours, down two hours.

New work in Ellis County: Phillips Petroleum Co. No. 2 Staab, C W half W half NE section 11-12-18w, building rotary rig; Carter Oil Co. No. 4 Staab, SW SE NW section 11-12-18w, location; Twin Drilling Co. No. 1 Carlin, NE NW SE section 6-12-17w, drilling at 1,114 feet; Earl Wakefield and others No. 1 Burnett, NW NW NE section 1-11-18w, wildcat, moving in material; Texas Co. No. 4 Bemis A, NE SE NE section 28-11-17w, location; Margay Oil Co. No. 6 Bemis C, NE SE SW section 22-11-17w, topped anhydrite at 1,227 feet, set 10-inch casing and was waiting on cement; Vickers Petroleum Co. and others No. 1 Parker, C N half NE NW section 35-11-16w, wildcat, moving in material.

Ellsworth County

Carter Oil Co. and others No. 4 Groth, SW cor. section 23-17-9w, Lorraine field, Ellsworth County, had Siliceous lime at 3,170 feet, was bottomed at 3,197 feet, pumped 107 bbls. of oil in six hours, was acidized and made potential of 248 bbls.

Phillips Petroleum Co. No. 2 Patzner, SW cor. section 30-17-10w, was a rotary rig.

Reno County

Shell Petroleum Corp. No. 4 Whipple, NW cor. section 14-26-9w, Lerado field, Reno County, found Viola lime at 4,128 feet, was bottomed at 4,134 feet, acidized, flowed 950 bbls. of oil in six hours, making potential of 3,592 bbls. Same operator's No. 3 Lee, SW SW SE section 10-26-9w, flowed 703 bbls. of oil in six hours after acid treatment, making potential of 2,659 bbls. Top of Viola lime was 4,136 feet; total depth 4,139 feet.

Magnolia Petroleum Co. No. 4 Rodgers, SW cor. section 9-26-4w, had Viola lime at 4,017-22 feet, total depth, was acidized and pumped 884 bbls. of oil in 24 hours.

Empire Oil & Refining Co. No. 1 Scheuchzer, NE NE NW section 20-24-4w, an old well, was deepened from 3,379 feet to 3,384½ feet, acidized and pumped 478 bbls. of oil and 130 bbls. of water in 24 hours.

Shaffer and others No. 3 Tucker, SW SW NW section 20-24-4w, pumped and flowed 1,820 bbls. of oil in 24 hours after acidizing at total depth of 3,382 feet.

Magnolia Petroleum Co. No. 5 Rodgers, NW SW SW section 9-26-4w, was a location.

Westgate-Greenland Oil Co. No. 1 O'Sullivan, SW SW NE section 24-23-5w, wildcat, topped Hunton lime at 3,730 feet, Misener sand 3,731 feet, Viola lime 3,843 feet, Wilcox sand 3,856 feet, Siliceous lime 3,945 feet and was dry and abandoned at 3,970 feet, total depth.

McPherson County

Continental Oil Co. and others No. 4 Hetzke A, SW SW SE section 20-21-1w, Graber pool, McPherson County, topped Hunton lime at 3,285 feet, was bottomed at 3,326 feet, acidized and made potential of 589 bbls. of oil. Same operators' No. 2 Boechner, C W half W half NW section 28-21-1w, was acidized and made potential of 548 bbls. of oil from Hunton lime at 3,326 feet, total depth 3,350 feet.

Western Kansas Oil & Refining Co. No. 1-A Unruh, NE NW SE section 31-19-1w, had pay at 2,973-75 feet, total depth, and produced 4,000,000 feet of gas.

Shell Petroleum Corp. No. 2 Lindberg, C NE NE section 15-19-2w, had Chat at 2,914 feet, total depth 2,956 feet, was acidized and pumped 10 bbls. of oil and 65 bbls. of water in 24 hours.

Dickey Oil Co. and Gulf Oil Corp. No. 9 Goering, NW NE SE section 17-21-1w, was a rig.

Stafford County

Stanolind Oil & Gas Co. No. 4 Komarek, SW SW SE section 30-22-11w, Stafford County, found Siliceous lime at 3,557 feet, total depth 3,585 feet, acidized and made potential of 1,849 bbls. of oil.

Empire Oil & Refining Co. No. 1 Neeland, SE SE NE section 16-25-14w, had Kansas City lime at 3,249 feet, was bottomed at 3,836 feet, acidized, flowed 1,120 bbls. of oil in eight hours and made potential of 3,366 feet.

Stanolind Oil & Gas Co. and Amerada Petroleum Corp. No. 1 Holmes, SE SE NE section 14-24-13w, found Siliceous lime at 4,078 feet, total depth 4,233 feet, and was dry and abandoned.

Atlantic Refining Co. No. 1 Kachelman, SE NW NW section 13-25-14w, wildcat, was a rotary rig.

Cowley County

Lloyd, Frost & Study completed another big producer in the Weatherford pool, Cowley County, at No. 1 Carson, NW NW SE section 33-31-3e. It flowed 2,714 bbls. of oil in 24 hours from Siliceous lime at 3,263-80 feet, total depth.

J. N. Wallace No. 1-A fee, SW SE SE section 10-33-4, wildcat, found water at 1,435-50 feet, total depth, and was abandoned.

New work in Cowley County: Trees Oil Co. No. 1 Hornbeck, NW cor. section 5-33-4, wildcat, building rig; E. B. Shawver No. 2 Brewer, NW SE SE section 5-34-3, ponds; Sinclair Prairie Oil Co. No. 2 Collinson, NE NW SE section 5-34-3, location.

Butler County

Roth & Faurot No. 1-A Harris, NE SW SE section 14-27-7, Butler County, had Bartlesville sand at 2,661 feet, total depth 2,720 feet, plugged back to 2,712 feet and pumped 70 bbls. of oil with some water in 24 hours.

First reports of new Butler County operations: Rex & Morris and others No. 2 DeMoss B, NE NW SE section 5-28-7, drilling at 1,205 feet; Polhamus and others No. 6 Semisch, SE SW NE section 5-28-7, drilling at 300 feet; Roth & Faurot No. 3 Harris, SE NW SE section 14-27-7, cellar; Western Kansas Oil & Refining Co. and others No. 1 Archer, NW NW NE section 3-26-5, rigging up machine; Saco Oil Co. No. 1 Townsite, NW NW NE section 3-26-5, drilling at 327 feet; Phillips Petroleum Co. No. 11 Ram, C SW SE section 20-23-4, location.

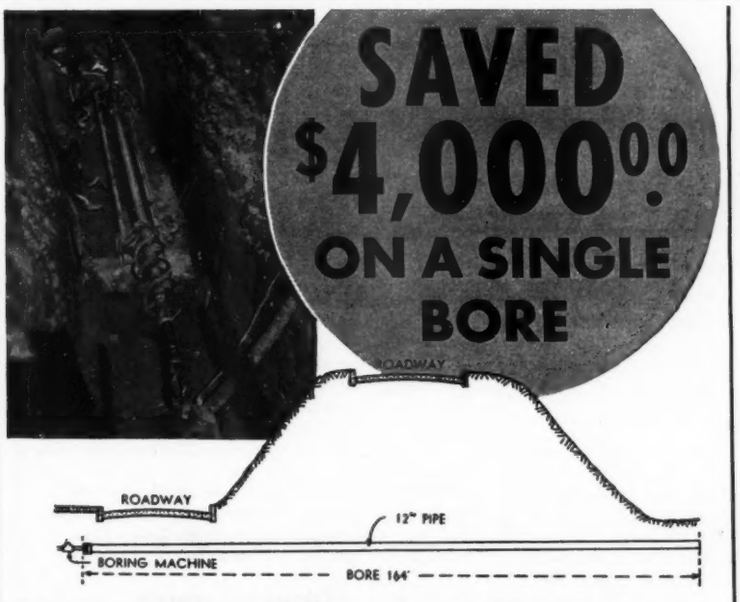
Greenwood County

Guy Scott and others No. 1 Hellman, SE NE SE section 6-26-10, Greenwood County, found lime at 2,117 feet, total depth 2,189 feet, acidized and pumped 25 bbls. of oil in 24 hours.

Van Deventer and others No. 1-A Bemis, NE SW SE section 12-28-11, wildcat, was dry and abandoned at 1,315 feet, total depth.

L. S. Balwanz No. 1 Travelers Insurance, C SW

(Continued on Page 192)



Hydrauger is operated by a 5 horsepower air-motor. It bores and reams at high speed, holes up to 14½" diameter. No underground formation is too tough. It is indispensable when wrapped or coated piping is installed.

Hydraugers continue establishing underground pipe installation records! This time a large Eastern gas company bored under a double roadway to install 164 feet of 12-inch extension. It's not only an all time record but a handsome saving of $4,000.00—a figure several times the cost of the Hydrauger! You can be sure that a Hydrauger will pay for itself in a few months. It does ordinary jobs better and faster—it does jobs considered "impossible" for any other method. Ask for Catalog today!

HYDRAUGER CORPORATION, LTD.
116 New Montgomery Street, SAN FRANCISCO

HYDRAUGER
"The Mechanical Gopher"

SAVE 50%

On SALT WATER Disposal Lines

Lowering 12-foot section of 4" VITRIFIED CLAY PIPE into trench for one of the major oil companies in Texas.

Build with Everlasting

DICKEY ACID-PROOF VITRIFIED CLAY PIPE and ASPHALT Joints

Here's why Dickey Vitrified Salt-Glazed Clay Pipe and Asphalt Joints solve your salt water disposal problems.

- Acid-Proof.
- Cost at least 50% less than other practical materials.
- Pipes and joints absolutely impervious to salt or other chemical action.
- Will last indefinitely.

Large stocks. Following sizes always available: 4, 6, 8, 10, 12, 15, 18, 21, 24, 27, 30 and 36 inches. Shipments made promptly from plants at Pittsburg, Kansas and Deepwater, Missouri.

ASK FOR AMAZINGLY LOW PRICES!

W. S. DICKEY CLAY MFG. CO.
KANSAS CITY, MO.

Oklahoma Operations

By
DAL DALRYMPLE

TWO BIG WELLS IN BILLINGS FIELD EXTEND PRODUCTION

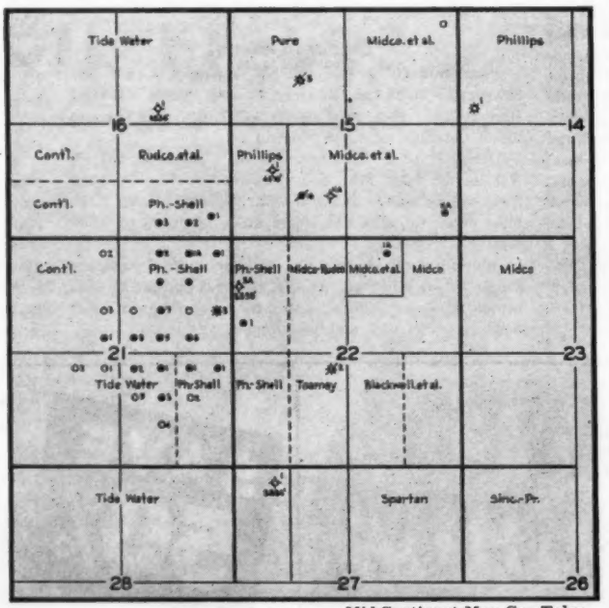
The south flank of the Billings pool in Noble County yielded two large producers the past week, the producing area being extended one location south. The extensioner was Tide Water Oil Co. No. 4 Hackett, NE SW SE section 21-23-2w, a 3,815-bbl. well. The other new producer was Phillips Petroleum Co. and Shell Petroleum Corp. No. 2 Hackett, SW NE SE section 21-23-2w, a 4,074-bbl. well, bottomed at 4,341 feet in Wilcox sand.

Two west side wells were near completion on the Continental Oil Co. lease in NW section 21-23-2w. If producers, they will enliven activity in that sector of the field. About eight other tests are seeking the rich Wilcox pay in this district, the newest being the Phillips and Shell companies No. 3 Hackett, NW SE SE section 21-23-2w, southwest corner of the pool.

A second well was near completion in the new Muse sector of Pontotoc County, between the Fitts and Jesse fields. E. H. Moore No. 1 Thompson, NW SE SE section 33-2n-7, flowed 142 bbls. of oil in two hours after acidizing and appeared to be a larger producer than the No. 1 Muse discovery well. Several tests have started in this area, immediately north of the fault at Fitts.

Opening of a new producing area in Kiowa County was imminent at E. A. DeBolt and associates No. 1 Burnett, SE NW SE section 30-7-20w. It had not been completed but operators estimated it as good for 50 bbls. of oil and about 1,000,000 feet of gas daily. It bailed considerable free oil from Granite Wash at 952-970 feet. East of the new well, Principle Oil Co. No. 1 Schierloh, SE NE SE section 28-7-20w, had considerable oil in the hole at 1,024 feet, total depth, but had not been tested. Several wells have been started in this sector.

A deep wildcat disappointment marked the week's activities in southwestern Oklahoma. Olson Drilling Co. and Heenan & Coe No. 1 Rose, C SW SW section 1-5s-5w, Jefferson County, drilled to 5,024 feet with nothing showing. Contract depth was 5,000 feet, but it may be extended and well drilled deeper later.



Mid-Continent Map Co., Tulsa.

Billings production was extended at Tide Water Oil Co. No. 4 Hackett, NE SW SE section 21-23-2w. Map shows only the deep pay producers in the field

Pontotoc County

A large Fitts field producer was completed at E. H. Moore No. 1 Frazier, NE SW NW section 23-2-7, Pontotoc County. It topped Hunton lime at 3,826 feet, was bottomed at 3,859 feet and flowed 894 bbls. of oil in one and one-half hours through casing, making potential of 5,861 bbls. Gas volume was 4,800,000 feet, and bottom-hole pressure was 1,530 pounds.

Shell Petroleum Corp. No. 2 Bates, NE NE NW section 26-2-7, had Hunton lime at 3,570 feet; Sylvan 3,917 feet; Viola 4,022 feet, Bromide 4,205 feet, total depth 4,366 feet. Water intruded and it was plugged back to 3,960 feet, shot and acidized, flowed 655 bbls. of oil gross in one hour, and made potential of 4,183 bbls.

Harry Blackstock No. 5-A Harden, NW SE NW section 30-2-7, topped Hunton lime at 3,423 feet, Sylvan shale 3,706 feet, and was bottomed at 3,707 feet. After acid treatment it flowed 800 bbls. of oil gross in six hours through tubing, and made potential of 1,711 bbls.

Magnolia Petroleum Co. No. 3 Morin, SE NW SE section 20-2-7, found Hunton lime at 3,775 feet, had a hole full of water at 4,444 feet, total depth, plugged back to 4,125 feet, shot and acidized, and flowed 252 bbls. of oil gross in two hours; potential 2,056 bbls. Same company's No. 14 D. Harden, NW NE NW section 30-2-7, topped Bromide at 4,280 feet; total depth 4,410 feet, acidized, flowed 357 bbls. of oil gross in one hour, making potential of 1,195 bbls. Same company's No. 19 Simpson, SW SE NE section 29-2-7, flowed 339 bbls. of oil through tubing in 24 hours, from Cromwell sand at 2,415 feet; total depth 2,550 feet. It was a quadruplet well drilled as a Cromwell test.

Fleetborn Oil Corp. No. 2 Lewis, SW SE SW section 19-2-7, found Viola lime at 4,095 feet, was bottomed at 4,310 feet, treated with acid, flowed 220 bbls. of oil gross in one hour and made potential of 466 bbls.

Completions at Jesse

In the Jesse sector, Mid-Continent Petroleum Corp. No. 2 Statler, NE SE SW section 2-1n-7, found Bromide at 4,375 feet, total depth 4,539 feet, flowed 925 bbls. of oil in eight hours; potential 1,578 bbls. Same operator's No. 4 Statler, SE NE SW section 2-1n-7, had a hole full of water at 1,142 feet, total depth, failed to make a producer by plugging back and shooting and was dry and abandoned.

In the Allen sand district, northern Pontotoc County, Mary F. Oil Co. and others No. 1 Miller, SW NW SW section 15-5-8, was shot and pumped 48 bbls. of oil in 24 hours from sand topped at 930 feet, total depth 950 feet. Same company's No. 4 Smith, NW SE section 16-5-8, had Allen sand at 931 feet, total depth 947 feet, shot and pumped 6 bbls. of oil in 24 hours.

W. A. Delaney and others No. 1 Norris, NW NW SE section 18-4-8, found Senora sand at 693 feet, was bottomed at 700 feet and produced 1,000,000 feet of gas, completed.

New work in Pontotoc County: Norbia Oil Co. No. 1 Kennedy, SE SE NE section 13-2n-5, wildcat, cellar and pits; E. H. Moore No. 9 Smith B, SW SE SE section 25-2-6, cellar and pits; same operator's No. 10 Smith B, SE cor. section 25-2n-6, cellar and pits; same operator's No. 1-B Moody, NW cor. section 26-2-7, location; E. H. Moore No. 3 Woodruff, NE NW SE section 29-2-7, an old well, rigging up to deepen to Hunton lime; W. A. Delaney No. 1-A Norris, NW NW SE section 18-4-8, rigging up rotary; Stanolind Oil & Gas Co. No. 3 Allen, NE SE NE section 32-5-5, building rig; Sinclair Prairie Oil Co. No. 2 Forney, SW NW SW section 28-5-8, location.

Seminole County

A new Seminole County pool opener, Sinclair Prairie Oil Co. No. 1 Rossanna, NW NW SW section 28-10-8, was completed at 4,189 feet, total depth. It has been flowing more than 1,000 bbls. of oil daily. It topped Simpson Dense at 4,148 feet; Dolomite, 4,149 feet; Wilcox sand, 4,176 feet. Gravity of the oil was 39 degrees. This wildcat is southwest of the old Cromwell pool and east of the North Bethel pool.

Two new producers were completed on the east side of the North Bethel pool. Amerada Petroleum Corp. and others No. 4 Pryor, NE NE NW section 36-10-7, topped Cromwell sand at 3,604 feet, total depth 3,619 feet, and made potential of 2,187 bbls. of oil, with 1,000,000 feet of gas. Same operator's No. 3 Noble, SE SE SW section 25-10-7, found Cromwell sand at 3,615 feet, was bottomed at 3,632 feet and made potential of 1,640 bbls. of oil, with 1,500,000 feet of gas.

Amerada Petroleum Corp. and others No. 2 Riddle, SE NW NE section 2-10-5, found Wilcox sand at 4,619 feet, total depth 4,624 feet, and swabbed 872 bbls. of oil in 13 hours and 15 minutes.

Creekmore & Wolf No. 1 Campbell, SW NW NW section 20-9-7, an old well, was deepened from 3,469 feet to Hunton lime at 4,041 feet, total depth 4,089 feet, was acidized and pumped 94 bbls. of oil net, with some water, in 24 hours. Wood Oil Co. No. 1 Mayhue, NE cor. section 14-9-6, an old well, was dry and abandoned after plugging back from 4,024 feet to Booch sand.

First reports of new work in Seminole County were as follows: Eason Oil Co. and others No. 1 Orwig, SE cor. section 15-6-6, cellar and pits; D. Malarnee and others No. 3 Flowers, SE SE SW section 29-7-6, location; Stanolind Oil & Gas Co. No. 4 Foster, NE SW SW section 28-8-8, an old well, rigging up rotary to deepen; W. C. McBride, Inc., No. 1-A Haulsey, SW cor. section 8-9-7, rigging up rotary; Amerada Petroleum Corp. and others No. 2 McLaren, NE NW NE section 36-10-7, building rig; Pioneer Drilling Co. No. 1 Edwards, NE SE SE section 35-10-7, cellar and pits; Amerada Petroleum Corp. and others No. 2 Marthia, SW SW NW section 36-10-7, building rig.

Okfuskee County

Sinclair Prairie Oil Co. No. 2 Phillips, SE SE NE section 24-10-8, Olympic field, Okfuskee County, topped Senora sand at 1,864 feet; total depth 1,880 feet, was shot and swabbed 72 bbls. of oil in the first 18 hours, and later swabbed 55 bbls. in 24 hours.

Champlin Refining Co. No. 1 Maudie, SE SE SW section 7-10-9, found Senora sand at 1,855 feet, was bottomed at 1,872 feet, was shot and pumped 10 bbls. of oil and 20 bbls. of water in 24 hours.

Chapman & McFarlin No. 2 Dunn, NE NW NW section 18-10-9, pumped 10 bbls. of oil and 22 bbls. of water in 24 hours after shooting from Senora sand topped at 1,860 feet, total depth 1,885 feet. Oklahoma Oil Corp. No. 1 Morris, NE SW SW section 8-10-9, had dry Senora sand at 1,850-1,934 feet and was dry and abandoned at 1,936 feet, total depth.

Kingwood & Southern Oil Co. No. 1 Wright, NE

RYERSON STEEL

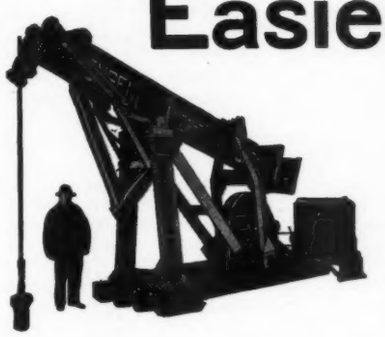
IMMEDIATE STOCK SHIPMENT

Bars, structurals, rails, sheets, plates, special alloy and tool steels, stainless steel (Allegheny metal) sheets, bars, etc., shafting, welding rod, babbitt, boiler tubes and fittings, wire, reinforcing bars, pipe, copper, brass, turnbuckles, metal working tools, etc.

Write for the Ryerson Stock List.

JOSEPH T. RYERSON & SON, INC. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Cleveland, Detroit, Buffalo, Boston, Philadelphia, Jersey City. Offices at: Tulsa, Kansas City, Minneapolis.

OIL Lifts Easier



Nineteen years ago we began the study, design and manufacture of pumping equipment.

We have had the wholehearted co-operation of successful producers through all these years.

All our efforts have been directed at the problem of lifting oil with less expense and more efficiency, in wells of any depth and volume.

Are you familiar with the latest JENSEN Straight-Lift Pumping Units and Rod Line Jacks—products of nineteen years of progress? If not, you owe it to yourself to . . . .

SEE THE JENSEN DEALER IN YOUR TERRITORY—OR WIRE US AT COFFEYVILLE.

JENSEN

BROTHERS MANUFACTURING COMPANY

Coffeyville, Kansas

NE SE section 25-11-9, was dry and abandoned at 1,616 feet, total depth.

W. B. Wells No. 7 Micco, C W half SE NE section 14-10-11, had a hole full of water at 2,540 feet, total depth; plugged back to 1,635 feet, shot and pumped 8 bbls. of oil in 24 hours.

Three new operations in Okfuskee County were reported. as follows: W. B. Wells No. 1 McKinnon, SE SE SW section 11-10-11, rigging up machine; Lease Investment Co. No. 1 Porter, SW SE SE section 4-13-10, rig and moving in tools; Riverland Oil Co. No. 1 Board, NE NW SE section 10-13-10, wildcat, moving in machine.

Osage County

Lewis Production Co. and Texas Co. No. 9 Claremore, SE NW SE section 17-24-7, Naval Reserve area, Osage County, flowed 63 bbls. of oil in 24 hours before shot, and 144 bbls. in 24 hours after shot. Top of Bartlesville sand was 2,617 feet; total depth 2,651 feet.

Pure Oil Co. No. 172 Osage, NE NW SE section 5-23-8, had Burgess sand at 2,484 feet; total depth 2,525 feet, and swabbed 40 bbls. of oil in 24 hours, after shooting.

Gray & Tolson No. 1 Osage, SE SW NW section 27-21-9, topped Layton sand at 1,056 feet, total depth 1,065 feet, was shot and pumped 10 bbls. of oil daily.

Johnson Oil Refining Co. No. 10 Osage, SE NE SW section 30-21-9, was completed as a repressure well at 337 feet, total depth. Wolverine Oil Co. and others No. 45 North Avant Unit, SE SW NE section 31-24-12, was completed as a repressure well at 1,767 feet, total depth. Pure Oil Co. No. 7 Osage, NW NE NE section 19-22-10, an old well, was deepened from 1,922 feet to Arbuckle lime at 2,220-30 feet, total depth, had a hole full of water and was abandoned.

New work in Osage County: F. A. Haver No. 2 Osage, SW SE SW section 16-23-11, an old well, preparing to deepen; Lewis Production Co. and Texas Co. No. 10 Claremore, SW NW SE section 17-24-7, location; F. M. Penney and others No. 296 Osage, SW SW NW section 15-24-8, an old well, preparing to deepen; Powers & Quinlan No. 10 Osage, SW SE SE section 26-24-8, location; R. L. Lamar No. 72 Osage, SE SW NW section 24-27-10, location; Indian Territory Illuminating Oil Co. No. 446 Osage, NW SW SW section 21-27-11, location; Lewis Production Co. No. 5 Smith B, NE NW NE section 33-24-7, location.

Pottawatomie County

Gulf Oil Corp. No. 2 Benjamin, NW SE NW section 13-7-4, St. Louis district, Pottawatomie County, had Wilcox sand at 4,159 feet, total depth 4,167 feet, swabbed 524 bbls. of oil in 24 hours and later pumped 640 bbls. in 24 hours.

R. W. Olsen No. 2 Junk, NW SE SE section 32-11-4, had Earlsboro sand at 4,370-4,420 feet, total depth, swabbed 130 bbls. of oil in 11 hours; was shot and pumped 166 bbls. of oil in 24 hours.

Tom Phillips and others No. 2 Briedenthal, C E half NW NE section 23-11-6, had Hunton lime at 4,215 feet, Wilcox sand 4,543 feet, total depth 4,549 feet, with a hole full of water; plugged back to 4,350 feet, was shot and flowed 573 bbls. of oil in 24 hours, cutting 2 per cent water. It was completed with an allowable of 100 bbls. of oil daily.

Three new operations in Pottawatomie were as follows: Magnolia Petroleum Co. No. 3 Jones B, SE NW NE section 18-7-4, location; Atlantic Refining Co. No. 1 Dooley, SE SE SW section 9-11-5, wildcat, rig; Arrow Drilling Co. and Kemrow Drilling Co. No. 1 well, C E half SW SE section 14-11-6, cellar and pits.

Noble County

Tide Water Oil Co. No. 4 Hackett, NE SW SE section 21-23-2w, extended production one location south in the Billings pool, Noble County. It topped Wilcox sand at 4,307 feet, was bottomed at 4,330 feet, flowed 961 bbls. of oil in six hours, making potential of 3,815 bbls. Gas averaged 5,340,000 feet.

Phillips Petroleum Co. and Shell Petroleum Corp. No. 3 Hackett, NW SE SE section 21-23-2w, was a rig.

Garfield County

The North Lucien pool of southwestern Noble County was extended across the line into Garfield County at Shell Petroleum Corp. and others No. 1 M. E. Tate, C SE NE section 36-21-3w. Top of first Wilcox sand was 5,381 feet, total depth 5,382 feet. It swabbed 122 bbls. of oil and 12½ bbls. of water in six hours, making potential of 330 bbls. of oil.

Okmulgee County

Craig and others No. 1-A Dunn, C N half NW NE

Do You Know

The advantages possessed by

B-M-W Admore Insert Pump Anchors

?

Patent No. 2,027,783

No Working Barrels. No Seating Nipples. No Mechanical Shoes. No Pulling of Tubing. Packs off and holds down directly in the tubing itself. Saves on sucker rods and other equipment where fluid level is high and well can be pumped above bottom. Complete data on request.

Principal B-M-W Products are obtainable at supply stores, including: ● ADMORE Insert Pump Anchors; ● NEILSON Tools (Safety Sucker Rod Hooks, Tubing Hooks, Rod Elevators, Sucker Rod Sockets, etc.); ● BALLS and SEATS (made for every pumping service); ● ADMORE Liner Barrels; ● TEX TYPE Plunger Fittings and Valves; and ● COLLINS Belt Clamps.

BRADFORD MOTOR WORKS INC

OIL WELL SUPPLIES

BRADFORD, PA. — TULSA, OKLA.

Straighten Out... those CROOKED Holes *with* SPERRY - SUN Well-Surveying Instruments

Write for literature.

SPERRY-SUN WELL SURVEYING CO.

1608 Walnut St. Philadelphia, Pa.

Tulsa, Okla., 425 Petroleum Building
Houston, Texas, 3118 Blodgett Avenue
Long Beach, Calif., 549 East Bixby Road, (3800 Block—Atlantic Ave.)

section 21-13-14, Morris area, Okmulgee County, had Morris sand at 1,618-42 feet, total depth, was shot and pumped 30 bbls. of oil in 24 hours.

Bingham & Hewitt No. 1-A McMillan, NW NW SW section 34-14-14, Bald Hill pool, had Booch sand at 1,177-87 feet, total depth, was shot and pumped 5 bbls. of oil daily.

E. W. Ladd and others No. 2-B Stidham, SW SE NW section 27-15-14, was shot and pumped 35 bbls. of oil daily from Dutcher sand at 1,686-1,733 feet, total depth.

Reliance Oil Co. No. 5 Childers & Anthis, SE NW NE section 27-16-11, Mounds district, had Wilcox sand at 2,968 feet, water intruded and it was dry and abandoned at 2,984 feet, total depth.

New work in Okmulgee County: Eagle Picher Lead & Zinc Co. No. 3 Henry, NE NW SE section 27-12-12, machine; Price & Brown No. 1-A Grayson, C N half SE NE section 21-14-14, drilling at 100 feet; Bingham & Hewitt No. 2-A McMillan, NW SW NW section 34-14-14, moving in machine; Lease Investment Co. No. 5 Field, SE NW NW section 16-14-11, location; same company's No. 2 Field, NW SE NW section 16-14-11, location; Adkins and others No. 1-A Ware, C E half NE NE section 36-16-11, drilling at 250 feet.

Muskogee County

Armstrong & McLeod No. 1-A Merriweather, SE cor. section 16-14-16, Boynton area, Muskogee County, had sand at 1,648-57 feet, total depth, and produced 12,300,000 feet of gas.

Claude Garrett No. 1 Gilbray, SW NW NE section 13-13-15, Sheppard area, topped Wilcox sand at 2,757 feet and was dry and abandoned at 2,810 feet, total depth.

Eagle Picher Lead & Zinc Co. No. 1-A Smith, SE NE NW section 13-13-15, was moving in machine.

Tulsa County

Wheatley Brothers No. 1 fee, SE cor. section 4-19-12, produced 1,888,000 feet of gas from pay at 1,281-85 feet, total depth, completed.

S. W. Anthony No. 9 Wilcox, SW NE NW NW section 3-16-12, was a cellar.

Activity in the Tulsa Airport pool is beginning to slow down, but several new tests have been started in the South Owasso area in eastern Tulsa and western Rogers counties as an aftermath of the Tulsa excitement.

Hughes County

Winona-Jarvis-Holmes No. 2 Harjo, SE SE NW section 20-7-8, West Holdenville area, Hughes County, found Booch sand at 2,897 feet, total depth 2,937 feet, was shot, swabbed 80 bbls. of oil in 24 hours and after cleaning out, pumped 125 bbls. in 24 hours.

Estimated Daily Production

Estimated daily average production of Oklahoma for the week ending May 22, and for the preceding week, was as follows:

	Barrels	
	May 22	May 15
Allen	6,000	6,000
Burbank	7,850	7,875
South Burbank	16,300	16,400
Balance Osage	22,200	22,150
Blackwell district	5,375	5,325
Bristow-Slick	7,750	7,825
Chandler	3,100	3,125
Crescent	11,375	12,900
Cromwell	3,500	3,550
Cushing-Shamrock	10,350	10,475
Duncan district	3,725	3,750
Edmond	19,650	21,000
Fish	5,725	5,850
Fitts	89,225	96,525
Jesse	2,950	5,000
Graham	4,750	4,725
Gray	1,150	1,300
Healdton	9,725	9,725
Hewitt	4,475	4,500
Holdenville	900	925
Keokuk	10,700	10,250
Lucien	14,350	14,250
Moore	12,750	12,225
Oklahoma City	169,525	169,700
Olympic	14,575	15,200
Papoose	900	925
Polo	1,500	1,575
Sasakwa and townsite	2,925	2,950
Sholem-Alechem	3,075	3,100
Seminole:		
Bowlegs	11,725	11,675
Carr City	5,900	5,825
Earlsboro	6,525	6,300
South Earlsboro	725	725
East Earlsboro	7,650	7,525
Little River	10,825	10,875
East Little River	1,175	1,100
Maud	825	775
Mission	2,425	2,075
Seminole	10,175	9,450
East Seminole	3,025	3,150
Searight	4,725	4,800
Total Seminole	65,700	64,275
St. Louis-Pearson	23,175	22,750
Tatums	5,175	5,025
Tonkawa-Garber-Thomas	9,900	9,975
Wewoka	3,225	3,300
Yale-Jennings	4,225	4,200
Other pools	71,950	72,025
Total Oklahoma	649,725	660,650

Garvin County

Simpson-Fell Oil Co. No. 2 Derdyn, NW SW NW section 17-1n-3w, Robberson area, Garvin County, an old well, was deepened from 1,590 feet to 1,805 feet, plugged back to 1,665 feet and was recompleted as a 7-bbl. pumper.

S. Westheimer No. 1-A Pearce, NW NE SW section 13-1n-3w, topped Arbuckle lime at 1,465 feet, had a hole full of salt water and was abandoned at 1,707 feet, total depth.

Two new Garvin County tests were reported: Simpson-Fell Oil Co. No. 9 Derdyn, CEL SE NW section 17-1n-3w, rigging up rotary tools; Carter Oil Co. No. 1 Potts, C E half SE NW section 36-1n-3w, location.

Marshall County

Neff & Godfrey No. 1 Chapman F, SW SE SW section 36-4s-4e, was location for a wildcat test in northern Marshall County, just south of the Johnston County line. It is to be drilled to 3,000 feet.

Carter County

Shell Petroleum Corp. No. 16 Horton, SE SW NE section 6-4s-3w, Healdton field, Carter County, was shot and completed as a 75-bbl. pumper at 1,160 feet, total depth. Oil sand series was topped at 1,015 feet. Kewanee Oil & Gas Co. No. 9 Ferguson, NW SE NW section 6-4s-3w, was completed in sand at 1,121 feet, total depth, was shot and pumped 44 bbls. of oil and 20 bbls. of water. Sinclair Prairie Oil Co. No. 19 Mullen, C NL SE NE section 4-4s-3w, was completed as a 20-bbl. pumper at 1,061 feet, total depth. Pure Oil Co. No. 25 Westheimer & Daube, NW cor. section 10-4s-3w, had sand at 1,075 feet, total depth 1,107 feet, and pumped 14 bbls. of oil daily.

Hefner & Bray No. 2 Perkins, SW SE SE section 4-1s-3w, Tussy area, had sand at 2,770-80 feet, total

They're Rugged!

Dodge-Timken Bearings Aid Oil Field Production

THAT steady, severe, continuous service that BEARINGS encounter in the oil field "weeds" out the weaklings and brings out the leaders — Dodge-Timken Bearings, widely preferred by the industry are rugged aids to uninterrupted production . . . For normal or heavy service — for excessive dust or water conditions — there is a Dodge-Timken Bearing designed and built to insure satisfactory performance under every service condition . . . Specify Dodge, a leader in the field of power transmission . . . Send for catalog.

DODGE MANUFACTURING CORPORATION
MISHAWAKA, INDIANA, U. S. A.

Let us send you a copy of this catalog which describes Dodge Rolling Bearings.

THE Right DRIVE FOR EVERY JOB

• See the Dodge 20-page Section in the Oil Field Composite Catalog. •

DODGE
MISHAWAKA
THERE IS REAL VALUE IN THE NAME DODGE

depth, swabbed 300 bbls. of oil in 24 hours, and was completed as a pumper.

Lykins & Wakefield No. 1 Luke, NW NW SW section 9-1s-2w, was completed as a 1-bbl. pumper at 275 feet, total depth.

Skelly Oil Co. No. 2 Higgins, SW NW NW section 8-2s-2w, was bottomed at 2,800 feet, plugged back to 2,505 feet and swabbed 92 bbls. of oil in first 16 hours. Gas was estimated at 2,000,000 feet, and it was flowing about 20 bbls. of oil daily when completed. Simpson-Fell Oil Co. No. 4 Davis, NE SW NW section 9-2s-2w, had pay at 1,631 feet, total depth 1,725 feet and was completed as an 85-bbl. pumper.

New work in Carter County: Carlos Wagner No. 1 Eaves, SE NW NW section 4-2s-2w, machine; Kewanee Oil & Gas Co. No. 34 Jones, SW SE NW section 4-4s-3w, an old well, cleaning out; Shell Petroleum Corp. No. 50 McClure, SW SE NW section 5-4s-3w, location; Carter Oil Co. No. 42 Ward, SW NE NW section 6-4s-3w, machine; Pure Oil Co. No. 8 Collins, NE SW NE section 16-4s-3w, an old well, cleaning out; Shell Petroleum Corp. No. 1 Smith, NW SE NE section 30-5s-1e, wildcat, cellar and pits.

Southwestern Oklahoma

Farlyn Oil Co. No. 43 Seay, NW SW SE section 3-7s-5w, Jefferson County, had sand at 1,200-1,219 feet, total depth, was shot and pumped 140 bbls. of oil daily.

A. T. Campbell and others No. 2 Trout, NE SE NE section 6-8s-7w, Jefferson County wildcat, had water sand at 2,147-53 feet and was dry and abandoned at 2,206 feet, in sandy lime. Bridwell Oil Co. No. 14 Wahlgemuth, NW SW NE NW section 30-6s-5w, new Jefferson County test, was rigging up rotary tools. Palmer and others No. 3 Barrett, NW SE SW SW section 19-6s-5w, was drilling at 550 feet.

In Stephens County, Carl Carter No. 8 Harley, NE SE NE section 24-2s-4w, was completed as a 6-bbl. pumper at 432 feet, total depth. Earl W. Stephens No. 3-A fee, SW cor. section 3-2s-5w, was completed as a 6-bbl. pumper at 993 feet, total depth. Carl Carter No. 9 Harley, NE SE NE section 24-2s-4w, was estimated good for 4 bbls. at 432 feet, total depth, but was not a completion. Armor & McAlester No. 2-B Nigh, SE NE SW section 11-2s-8w, was drilling at 2,000 feet. Healdton Petroleum Co. No. 8 Jamerson, NE SW SE section 14-2s-4w, was drilling at 130 feet.

In Tillman County, J. Cavin and others No. 1 Gochler, NW NW NE section 4-5s-14w, had a junked hole and was abandoned at 1,356 feet, total depth. Same operators' No. 1 Southerland, SW SW NW section 35-4s-16w, wildcat, was rigging up rotary.

Various First Reports

Two wildcat locations in Grant County were reported: Carter Oil Co. and others No. 1 Crissman, C W half SW NW section 16-25-3w, south of Lamont, and Carter Oil Co. and others No. 1 Kolarik, C E half NW SW section 4-26-5w, south of Medford. Mid-Continent Petroleum Corp., Sinclair Prairie Oil Co. and Texas Co. are interested in the first test with the Carter company as operator, and those four companies, Magnolia Petroleum Co. and Indian Territory Illuminating Oil Co. are interested in the second test.

H. F. Wilcox Oil & Gs Co. No. 1 well, SW SE SW section 30-7s-23, wildcat northwest of Idabel, McCurtain County, had material on ground.

Carter Oil Co. had rig up and was preparing to resume work at No. 1 Thompson, C S half NE NW section 34-2n-9, old wildcat in the Centrahoma district, Coal County.

Shasta Oil Co. No. 4 School Land, SE NW SW section 36-1s-10w, Cotton County, was drilling at 1,800 feet.

Six new tests in Lincoln County were reported, as follows: Amerada Petroleum Corp. and others No. 1 Lobar, NW NW SE section 10-12-5, building rig; Phillips Petroleum Co. No. 1 Aranwine, SW NW SE section 35-15-2e, and No. 1 Witmer, SW SE NE section 35-15-2e, locations; Sun Oil Co. No. 2 Aranwine, NW SW SE section 35-15-2e, digging cellar; Mullendore No. 1 Keller, NW NE NW section 28-17-3e, location; Continental Oil Co. and others No. 1 Community, NW NW SE section 7-15-5, location.

Kiowa Lease Sale

Sealed bids on southwestern Oklahoma lands will be opened at the Kiowa Indian Agency, Anadarko, at 10 a.m. June 9. A total of 200 Indian tracts, including 26,176.77 acres, will be offered for lease. The lands are situated in Comanche, Caddo, Kiowa, Washita and Cotton counties.

$70,000 Worth of Derricks Saved!

With a FRANKS Pulling Unit

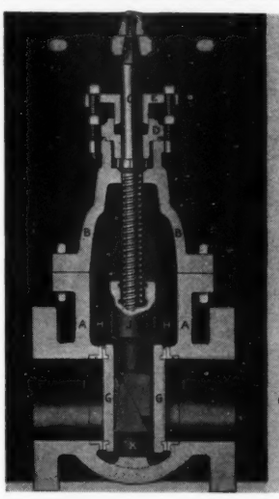
At the Panhandle Engineering Society meeting Feb. 24, 1937 an official of a large oil company reported the following: "We have been having great success with a Franks pulling machine—complete with pulling equipment, truck and telescoping mast—in pulling rods and tubing on our wells. The machine eliminates the necessity of derricks and permanent or portable masts over the wells. We are now taking down about 80 derricks which will not be replaced. This unit can be set up and rigged up within a few minutes, is cheaply operated, and can pull rods and tubing as well as they can be pulled with either a portable or permanent mast. The cost of this Franks unit is approximately $7,500 complete with mast, winch, truck, etc."

Franks units will give you the same service. Information and a demonstration gladly given.

FRANKS MFG. CORP.
WELL SERVICING AND DRILLING UNITS

P. O. Box 137, Whittier Station, Tulsa, Oklahoma.
Export Office: 149 Broadway, New York, N. Y.

Our Catalog is filed in the Composite Catalog.
See pages 590 to 596



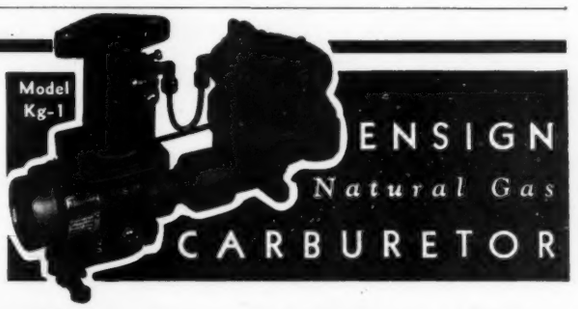
Built to LAST

Install Ludlow valves in high pressure oil and gas lines. They give years of dependable performance under the severest working conditions.

The cutaway illustration shows the simplicity of Ludlow construction. Fewer and more rugged working parts mean less wear—easier repairs. And the Ludlow method of wedge closure assures complete tightness. Send for a Ludlow catalog.

THE LUDLOW VALVE MFG. CO.
TROY, NEW YORK

Built
"SERVICE -WISE"
for OIL FIELD SERVICE



Maximum fuel economy, easy starting, smooth power delivery, and dependable operation are the advantages provided for oil field power units by the Ensign Natural Gas Carburetor.

These "service-wise" advantages are the result of Ensign's quarter century of specialized experience in the *precision* manufacture of carburetion equipment to meet all field conditions and requirements. Years of operation in the field have proved their superiority in efficiency and fuel consumption.

For complete information on this or other Ensign Carburetors see your nearest Ensign distributor.

Ensign now supplies approximately 90% of the national requirements for specialized types of carburetting equipment for gas fuels.

●

Butane Equipment; Gasoline Carburetors for Industrial Engines and Tractors.

ENSIGN CARBURETOR COMPANY, LTD.
Huntington Park, California

Chicago Branch: 2644 So. Michigan Avenue. Distributors with Stocks: A. W. Schuller, Inc., Tulsa, Okla.; The Binkley Co., Oklahoma City, Okla.; Portable Rig Co., Houston, Texas; H. G. Makelim, Oakland, California; T-V Supply Company, Wichita, Kansas

North Louisiana, Arkansas

By MITCHELL TUCKER

RODESSA ACTIVITIES FADING; ROTARIES MOVED TO LISBON

SHREVEPORT, La., May 24.—Only two oil wells were completed in the Rodessa field last week, one in Caddo Parish, Louisiana, and the other in the 12-mile extension area southwest in Marion County, Texas. For the first week in almost two years no completions were added to the wells in the Cass County, Texas, portion of the field.

Many rotaries have been moved out of Rodessa during the last 60 days, most of which have gone to the Lisbon field in Claiborne Parish, Louisiana. At present there are only six wells rigging up and 43 drilling throughout the entire Rodessa field.

Daily Allowable Cut

The Texas Railroad Commission has announced a cut in daily allowable production for the Texas side of the Rodessa field beginning June 1. The new allowable is a reduction of 5,515 bbls. daily from the May figure of 40,583 bbls. The cut is in line with reductions made generally over the state.

The weighted average bottom-hole pressure of wells on the Louisiana side of the field stood at 1,799 pounds as of May 1, according to data just released by the engineering committee of the Rodessa Operators Committee. This represents a drop of 23 pounds during April, or an average of 0.77 pounds per day. This pressure decline was a decrease in the rate of drop noted for March, which was 1.37 pounds per day.

Rodessa Deep Tests

R. W. Norton No. 1 Payne, SE SE section 27-23-16, Rodessa's deepest test, situated in the gas producing area about 1 mile south of the townsite, is coring at 9,780 feet. Drill stem test was made at 9,642 feet, with reported negative results. Operators washed the well for 17 hours and then rocked with gas pressure, but the reported saturated section at this depth failed to flow.

United Gas Public Service Co. No. 1 J. W. Land, in the gas producing area of Cass County, Texas, on the R. Potter Survey, made a Schlumberger survey at 7,200 feet and the hole has been plugged back from 7,255 feet to 6,530 feet, where it is planned to test showings logged in the Pettit lime at this depth.

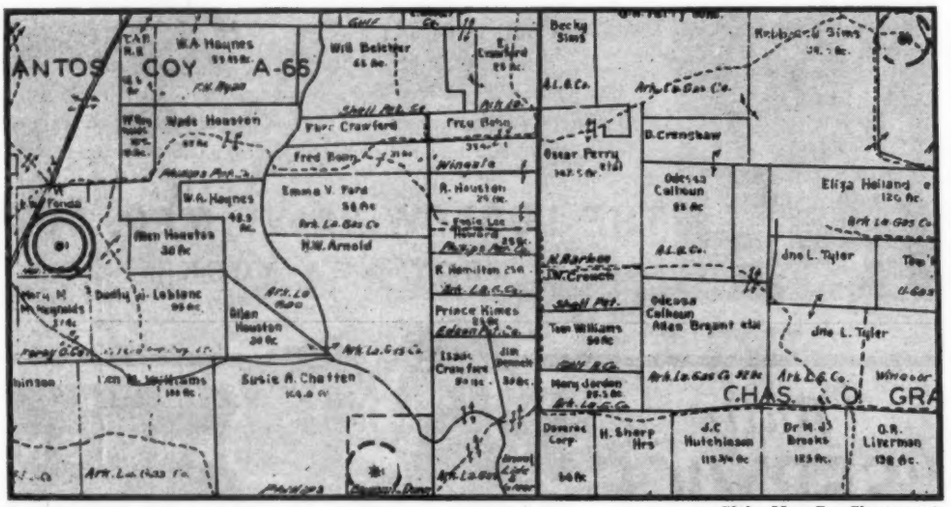
Marion County—Rodessa

The Hunter Co. of Shreveport completed its No. 1 E. W. Fonda, A. D. S. Coy Survey, 9 miles southwest of present production in the Rodessa field, flowing on official gauge 14 bbls. hourly through quarter-inch tubing choke, tubing pressure 65 pounds, casing pressure 485 pounds, total depth 6,094 feet.

The 12-mile area, heretofore considered as semi-proven, between the Rodessa producing limits and the outpost oil producer just north of Jefferson, has been made much more attractive following completion of the Fonda well.

On a 24-hour test the Jefferson discovery well, Holcomb, Thompson and others No. 1 Henderson, R. Bennington Survey of Marion County, flowed 119 bbls. daily through three one-sixteenth inch side wall chokes. Gas was estimated at about 1,000,000 feet. Offsets to this well are expected soon.

Arkansas-Louisiana Gas Co. No. 1 Laura McIntosh, William Edminston Survey, deep test of the Marion County extension area, found the Pettit lime and Upper Travis Peak sands dry. The well has been plugged back from 6,925 feet to 5,980 feet, where an effort will be made to complete it as a producer in the Gloyd sand.



Globe Map Co., Shreveport.

Hunter Co. No. 1 E. W. Fonda, A. D. L. Santos Coy Survey of Marion County, Texas, situated about midway in the 12-mile semiproven extension area southwestward from Rodessa production. To the northeast is indicated Arkansas-Louisiana Gas Co.'s discovery well at Lodi, and to the southeast is Bauman & Dunn's recently completed gas-distillate producer

Rodessa Completions

United Gas No. 9 Bremmer Unit, SW section 22-23-16, Caddo Parish, Louisiana, flowed 32 bbls. in four hours on initial test, through quarter-inch tubing choke, total depth 6,014 feet.

United Production Co. No. 1 Kate Spell Unit, Cass County School Land Survey, Texas, was completed as an 8,000,000-foot gas well, rock pressure 2,940 pounds, total depth 5,640 feet.

Bienville Parish

Lide & Greer No. 1 W. J. Smelley, SE NW SW section 18-16-4w, deep test of the Union Church area, is being closely watched. It drilled the Lower Glen Rose area last week. Salt water was tested in the Hill sand at about 5,348 feet, but the Gloyd and Young sections are reported to have carried gas and distillate saturation similar to that logged in the same operator's discovery well here. Drill stem test was made from 6,658-78 feet, with negative results. The Pettit lime top was picked up at 6,796 feet, but operators are now shut down while fishing at 6,800 feet for rock bit cone.

Bossier Parish

Premier Investment Co. No. 40 Wyche, SE NW NW section 14-19-11, a completion in the Bellevue field, pumped 5 bbls. daily, total depth 410 feet.

Triangle Drilling Co. of Shreveport made two oil well completions in the Sligo oil field, situated on the southwestern flank of the Sligo gas field. Their No. 2 Ross Unit, NW SW NW section 23-17-12, flowed 115 bbls. in 16 hours on initial test through quarter-inch tubing choke, tubing pressure 1,775 pounds, casing pressure 1,960 pounds, total depth 5,180 feet. Their No. 2-A State, SW section 23-17-12, flowed 125 bbls. daily through quarter-inch tubing choke, total depth 5,170 feet.

Estimated Daily Production

Estimated daily gross production all companies week ending May 22 follows:

NORTH LOUISIANA

	Bbls.
Bellevue	770
Caddo light	4,030
Caddo heavy	2,405
Converse	760
Cotton Valley heavy	300
Cotton Valley light	*1,390
DeSoto and Red River	1,495
Elm Grove	375
Haynesville	3,350
Holly	125
Homer	2,525
Lisbon	4,820
Pleasant Hill	130
Rodessa	49,475
Sarepta-Carterville	385
Sligo	175
Urania	2,805
Zwolle	815
Total	76,130

SOUTH ARKANSAS

Champagnolle	1,555
El Dorado	2,040
Lisbon	285
Miller County	530
Nevada	750
Schuler	300
Smackover light	2,150
Smackover heavy	17,050
Stephens	570
Troy	550
Urbana	1,340
Total	27,120

Texas side of Rodessa field—42,290 bbls. daily.

*900 bbls. is distillate.

Claiborne Parish

Standard Oil Co. of Louisiana No. 1 Baker, NW section 27-19n-7w, a once highly regarded test of its extensive Athens block, was abandoned last week at 7,247 feet, after checking low on all important markers, through the Upper Travis Peak.

Caddo Parish

As a routine completion in the Caddo field, G. R. C. Oil Co. No. 5 Herndon, NE SE NW section 22-21-15, pumped 40 bbls. daily, total depth 1,600 feet.

In the same field, Rodgers and others completed No. 1 Thompson, NW SW SW section 11-20-15, pumping 5 bbls. daily, total depth 2,204 feet.

Stanolind Oil & Gas Co. No. 122 Dillon, NW section 13-21-15, pumped 65 bbls. daily after acidizing, total depth 1,665 feet.

The Stanolind Oil & Gas Co. continues to add to their already heavy holdings in the Pine Island-Caddo fields. Last week a transfer was recorded covering 1,000 acres in the Gilliam area to this company, consideration of which was $100,000.00. Deep exploratory tests are planned here soon.

Lisbon Field—Claiborne Parish

One completion, six outfits rigging up and 19 drilling wells summarize activity for the closing week in the newly discovered Lisbon field. Total producers now number 20, and daily average production for the last week was 4,820 bbls. Gulf Refining Co.'s recently completed pipe line extension is connected to all wells in the field.

Bottom-hole pressure tests are now being made on key wells in the Lisbon field to be used in setting production allocations beginning June 1. At present, each well is given a daily allowable of 300 bbls. Effective June 1, production of individual wells will be based upon a 25 per cent bottom-hole pressure basis and 75 per cent acreage basis, in accordance with Order No. 9 issued by Louisiana Department of Conservation. Average bottom-hole pressure is expected to be about 1,780 pounds. Bottom-hole temperature tests about 160° F.

Ray P. Oden No. 2 W. H. Patton, NW SE SE section 36-21-5, flowed 834 bbls. on 24-hour test through one-half inch tubing choke, tubing pressure zero, casing pressure 250 pounds, total depth 5,352 feet. This well was acidized with 3,000 gallons before completion, and is rated as one of the best producers in the field.

Lyons & Neely No. 1 Bennett, just across the line in Lincoln Parish, section 5-20-4, is credited with drilling the thickest sand section yet reported at Lisbon. Topping the saturated section of lime at 5,323 feet, it was cored to total depth of 5,340 feet, or a total of 17 feet. Average sand thickness is from 8 to 12 feet in other wells completed, and a thickening of the section to the southeast is thought to be quite significant.

Sugar Creek Field—Claiborne Parish

The Sugar Creek Syndicate (Standard Oil of Louisiana., United Gas, and Triangle Drilling Co.) have begun deepening the third gas well on the northern flank of the old Sugar Creek gas field to the recently discovered oil sand in the Upper Travis Peak. Their No. 1 Carter, section 32-20-5, is now being deepened at a total depth of 5,528 feet.

Tanks have been erected for additional testing of No. 1 Dobbins, section 12-19-6, which flowed 257 bbls. in 18 hours through a five-sixteenths inch tubing choke, with casing pressure of 1,500 pounds, and tubing pressure of 1,275 pounds. This was a sharp contrast to the discovery oil well on the flank of Sugar Creek gas field, No. 1 Brown in section 1-19-6, which showed only 600 pounds tubing pressure and 1,000 pounds casing pressure after a 7,000-gallon acid charge. Discovery of this flank production in the Travis Peak has given rise to speculation on other possibilities of similar structures throughout North Louisiana.

DeSoto Parish

Benedum & Trees No. 1 Clifton, NE NW section 33-13-12, wildcat test of the Lower Glen Rose near Naborton, has been plugged and abandoned at 5,696 feet.

McDonald & Campbell No. 1 Jal Drilling Co. (formerly reported as Chamberlin No. 1 Lanier) Woodbine test south of the Bull Bayou field where attractive showings were reported in earlier wells nearby, is now coring at 2,800 feet and is expected to pick up the sand soon.

Stiller and others No. 2 Jenkins, NE SE NW section 35-13-12, which has been shut down for several months at total depth of 2,503 feet, has been abandoned at this depth.

LaSalle Parish

The Old Homestead Oil & Gas Co. No. 1 Zenoria, SW SE NW section 23-9-1e, flank test of Urania field, topped Wilcox sand at 1,601 feet, and was abandoned at 1,650 feet as a dry hole.

Lincoln Parish

Glassell & Glassell No. 1 Gray, SE section 16-20-3w, Lincoln Parish, logged massive anhydrite from 3,880 feet to 4,101 feet, and is drilling ahead below 4,250 feet.

Monroe Gas Field

Southern Carbon Co. No. 3 Miles, NE section 36-

(Continued on Page 198)

Solves YOUR BRAKE BLOCK problems

THE GRIZZLY ROTARY BRAKE BLOCK BAND EXCHANGE

by bringing you BRAKE BANDS RELINED WITH Genuine GRIZZLY FULL MOULDED BRAKE BLOCKS

. . . At No Extra Cost

You Get . . .

—Bands already lined with Grizzly Blocks . . . ready to put on your rotary rig.

—Genuine Grizzly Blocks of the RIGHT thickness, width, length, and radius for the particular draw works.

—Bands that are exact duplicates of the bands originally put on the draw works by the manufacturer.

—Both bands and blocks factory drilled exactly to manufacturer's specifications.

You Get Rid of . .

—Uncertainty as to getting the right lining for the job, the right size lining for the band, the correct drilling.

—The bother and interference of relining bands . . . all that is necessary is to install the new bands.

—Worn, warped trouble making bands . . . Under the Grizzly Band Exchange Plan such bands are turned in and junked.

A BEAR FOR WEAR

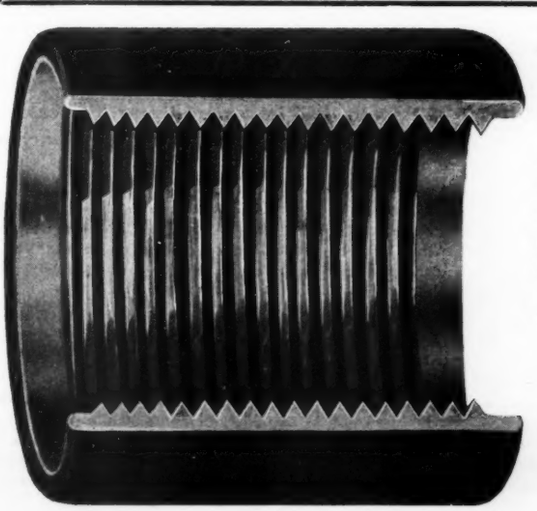
Under this convenient new plan you get bands delivered to you that are correctly curved to proper drum diameter; that insure perfect lining contact to the drum. It will pay you big dividends . . . in faster drilling, greater safety, and more ton miles of brake block service, while getting the benefit of the superior performance of Grizzly Full-Moulded Rotary Blocks. Leading supply houses stock Grizzly-Lined new steel bands for all types of rotary draw works . . . ask your supply man for complete details and prices.

E. M. SMITH COMPANY

600-650 SOUTH CLARENCE STREET, LOS ANGELES, CALIFORNIA

Sold in the Mid-Continent and Gulf Coast By All Leading Supply Stores

Warehouses in Oklahoma City, Oklahoma, and Houston, Texas



A.P.I. "X-L" *Line Pipe*

RECESSED COUPLINGS

Avoid weak joints! Diminish waste and increase profits! Our special patented process of recessing couplings assures perfect alignment, tighter joints and protection of vanishing—which, in turn, mean longer life to the line.

Inquiry invited—no obligation.

See your leading oil field distributor.

WHEELING MACHINE PRODUCTS COMPANY

WHEELING, W.VA.

Southwest Texas District

By GEORGE WEBER

ZAVALLA COUNTY DISCOVERY WELL STARTS WITH BIG FLOW

HOUSTON, Tex., May 24.—The Balcones fault zone figured prominently in an otherwise quiet week in Southwest Texas developments. With the discovery of a new field in Zavalla County, and increased activity, all along the trend from that point to Caldwell County, the fault zone is apparently due for considerable play, especially in the southwest section, which has been quiet for several months.

The Laredo district slump continues, with a few active spots, chief among which is the North Sweden field, which is due for rapid development. Although new discoveries were lacking in the Lower Gulf Coast or Corpus Christi district during the past week, interesting developments are expected in that area, as a number of wildcats progress, and several new ones are added. The Lower Rio Grande Valley is the scene of some work in Starr County, and Cameron and Willacy counties are being watched as deep tests begin.

The Zavalla County discovery is expected to lead to considerable activity in that area. The wildcat responsible for this strike is Wilcox Oil & Gas Co. No. 1 Gillam, located on the Gillam ranch, in section 11, about 28 miles west of the Pearsall field of Frio County and 6 miles southeast of the town of Batesville. The test was begun in late November, and was drilled with cable tools. Upon reaching a total depth of 3,948 feet operators encountered a soft formation in the Edwards lime. Seven-inch casing was set at 3,930 feet and tubing was run.

180 Bbls. an Hour

The well began flowing at a rate of 10 bbls. in the first eight minutes. Reported flows were 50 bbls. during the first half hour, and 180 bbls. during the next hour. Operators were last reported shutting the well in for storage. The crude is heavy and black, with a gravity of about 16 degrees. The flow is steady.

Although no definite new locations have been made for further drilling in the area, leasing is active, and a number of operators who have been interested in the section are expected to begin projected drilling. The Wilcox Oil & Gas Co. is believed to be planning several tests immediately.

Interest in Pearsall Field

Sharing in the new interest directed toward that section is the Pearsall field of Frio County. This production, held entirely by the Amerada Petroleum Corp. includes oil from four horizons; the Navarro, Buda, Austin and Edwards. At present Amerada is operating four rigs in the field, three of which were recently moved on old locations for workover tests. The No. 8 Halff & Oppenheimer is drilling below 9,850 feet, the deepest current drilling well in Southwest Texas.

During the week, location was staked for the Pagenkopf & Jamieson No. 1 Blackaller, a wildcat located in Frio County near the Medina County line, and about 900 feet south of the Lefevre No. 1 Blackaller, an old test. Amerada is drilling No. 1 Harriman in Survey 306 north of the Leona River, in the same county.

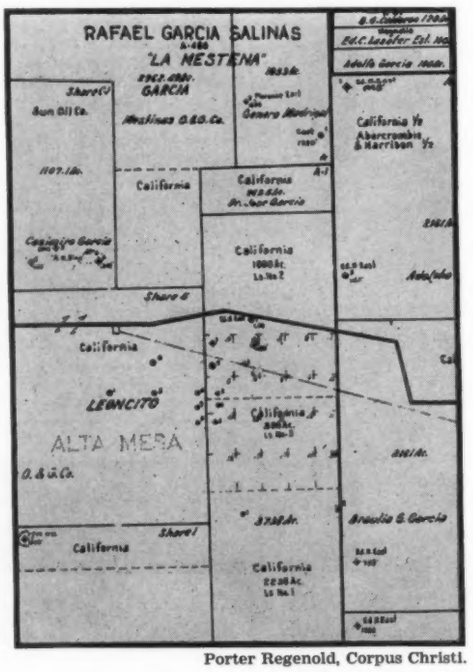
Guadalupe and Caldwell counties continue to be the centers of active drilling by independent operators. The Luling-Branyon area in the latter county has several wells drilling, with other operations now under way in the Buchanan, Dunlap and Salt Flats fields. In Guadalupe County drilling is confined mostly to the Darst Creek and Darst Creek extension areas. A wildcat in that county, Schimmel's No. 1 Schneider is reported completing in chalk at 2,036 feet. The test is located in the Cantu Survey, about 4 miles southwest of Seguin, and near the Darst Creek field.

Important Test in Aransas

Attention of operators in the Lower Gulf Coast was divided. Of prime interest to many is the outcome of Barnsdall Oil Co. No. 2 Kate Edwards, wildcat in Aransas County. The test, located on Lamar peninsula, offsetting the No. 1 which blew out and cratered at 7,996 feet, is approaching that depth. During the past week, operators made a drill stem test at 7,924 feet. The 3,000-foot water cushion was unloaded and the well showed 600 pounds pressure, trying to blow out. Mud was conditioned and the hole was carried deeper. at 7,935 feet the test flowed some mud, and at latest reports, the hole was bottomed at 7,965 feet and drilling. Since the blowout of the first test, large leases have been taken in the area, and success with No. 2 will doubtless lead to considerable development by Barnsdall and other operators.

New Sand in London Field

A new sand was opened to production in the London field of Nueces County, making gas. Cosner &



Porter Regenold, Corpus Christi.

Alta Mesa field, southern Brooks County, is being systematically developed by the Standard Oil Co. of Texas, formerly California Co. Production has been extended 4,000 feet to the south, and considerably to the west of the original field, where two rigs are active

Cosner brought in No. 2 Stockton for a gasser from sand cored at 4,901-07 feet. Casing was set and perforated at 4,898-4,907 feet. The sand is one of several which showed indications of production in the No. 1 discovery well, but this is the first well to be completed in it.

Several important wildcats are drilling in Nueces County, and two of especial interest are being started. They were staked by the Navarro Oil Co. and Gillock and others, both on the Poenisch land near the Flour Bluff field. The Navarro No. 1 Poenisch is located on Lot 21, section 14 of the Flour Bluff subdivision, about 4 miles northwest of the field, and the Gillock test is located about 2 miles west of the field. As the two first outpost tests for Flour Bluff since it was discovered, these will reveal much, it is expected, of the future extent of production in the area.

North Sweden Very Busy

North Sweden is the center of greatest activity in the Laredo district at present. The new field, recently discovered in southeast Duval County is shortly to be extended by Highland Oil Co. No. 1 Farias, which has set on sand at 4,795-4,804 feet. Benedum & Trees, Inc., No. 1 Puig, south offset to discovery, has the field sand at 4,743-52 feet, highest point at which it has yet been cored. Two other tests are approaching the sand, and three are getting under way in the field.

The Killam field, of Webb County, another new discovery, is not developing satisfactorily. Hamill & Smith's No. 2 Garcia was completed as a gasser at 2,000-05 feet during the week, and O. W. Killam No. 2 Garcia tested gas in the same sand and is coring deeper. Production is in the Mirando sand.

Southwest of the Seven Sisters field, and separated from it by a number of dry holes, the Brinkoeter No. 2 Garza, Survey 212, was brought in on a pump, making 75 bbls. per hour. That operator has two producers in the area and has begun drilling on No. 3.

Goliad County had indication of possible new production during the week, as the Goliad Oil Corp. No. 1 Cole blew out, making gas at a total depth of 5,545 feet. The test, located in the long-known prospect north of LaBahia, is making gas through a takeoff on the blowout preventer, as operators are attempting to kill the well.

Bee County's recent showing in L. Glasscock No. 1 Ablinger was a failure, as the test was abandoned this week at total depth of 5,945 feet. The operator plugged back to sidetrack around a stuck drill stem, but junked the hole after going back into the original hole.

Another abandonment followed the blowout of the Ohio Fuel Oil Co. No. 1 Rosebrock in the Oakville field of Live Oak County. The test blew for several days before being shut in and killed.

New York-Pennsylvania Gas

COUDERSPORT, Pa., May 24.—One well was completed, another is drilling into the sand and two new locations are contained in the report of operations in the New York-Pennsylvania deep sand gas fields for the week ended May 21.

G. L. Cabot, Inc., plugged and abandoned its well on the T. H. Wing farm, Greenwood Township, Steuben County, New York, after it filled up 1,200 feet with salt water. This well topped the Oriskany at 4,179 feet, found salt water at 4,185 feet and was deepened to 4,193 feet before it was abandoned.

Atwater and others' test on the Herrington farm in Woodhull Township, another Steuben County wildcat, found gas in the Oriskany and is running pipe. This well topped the sand at 3,955 feet and got the first show of gas, which gauged 75,000 feet per day on a test, 1 foot deeper. This test is northeast of the proven Harrison field and northwest of the Tioga field and is distant from any present defined production. Its completion is being regarded with considerable interest by operators.

The new operations, both in Pennsylvania, are:

French and others on the George Burd 55-acre farm, Allegany Township, Potter County, are building rig.

G. L. Cabot, Inc., has staked the location for a test on the A. J. Bride farm, Westfield Township, Tioga County.

Pennsylvania Operations

Kent Kane and others found a show of gas at 1,319 feet on Government Surface Lot 515, Watson

(Continued on Page 196)

Rocky Mountain Area

By T. R. INGRAM

HARDY AREA IN LEA COUNTY GIVEN HALF-MILE EXTENSION

DENVER, Colo., May 24.—Extension of the Grizzell area at the south end of the Hardy pool, Lea County, New Mexico, appeared imminent. The extensioner, Stanolind Oil & Gas Co. No. 1 Owens, C SE NW section 3-22-37, one-half mile east of the Grizzell area, flowed at the rate 16 bbls. of oil an hour through three-fourths inch choke on tubing after acid treatment. Top of pay was 3,646 feet; total depth 3,725 feet. It was not a completion.

Clovis Corp. No. 2 Wilmes (Sheely-Smith), C SE NE section 17-2s-30, closely watched wildcat in Roosevelt County, was abandoned when 3,000 feet of salt water rose in the hole in two hours at 3,618-76 feet, total depth 3,677 feet. Slight showings of gas were reported at 2,618-76 feet, total depth 3,677 feet. Slight showings of gas were reported at 2,801-09 feet; water at 3,303-15 feet and 3,318-45 feet, and a slight showing of oil at 3,377-79 feet.

One failure was reported in Eddy County. William Dooley No. 2 Hatchett, SW SW NE section 14-20-36, found water at 170-219 feet and was abandoned.

Fifteen new producing wells were completed in Lea County. Amerada Petroleum Corp. No. 2-A Byrd, section 12-20-36, topped pay at 3,796 feet, total depth 3,875 feet, and flowed 318 bbls. of oil naturally through choke in 10 hours 15 minutes. Same company's No. 4-F State, C SE SW section 36-19-36, flowed 360 bbls. of oil in six hours through choke; set packer at 3,872 feet and flowed 85 bbls. of oil an hour naturally for four hours, with 1,315,000 feet of gas. It topped pay at 3,810 feet and was bottomed at 3,905 feet, total depth 3,835 feet, flowed 444 bbls. of oil in the last four hours of a 5½-hour test, naturally and through choke. Same operator's No. 2-Z State, section 13-20-36, flowed 420 bbls. of oil in 15 hours through choke after acidizing pay topped at 3,782 feet, total depth 3,867 feet.

Atlantic Refining Co. No. 1-O State, section 32-20-37, found pay at 3,829 feet, was bottomed at 3,845 feet, acidized and flowed at the rate of 360 bbls. of oil daily.

Gulf Oil Corp. completed five wells. The No. 13-C Arnott-Ramsey, section 21-21-36, topped pay at 3,825 feet, total depth 3,902 feet, was acidized and flowed 292 bbls. of oil in six hours. The No. 2 Hatchett, C SW NW section 33-19-37, flowed 44 bbls. of fluid daily after two acid treatments in pay topped at 3,876 feet, total depth 3,905 feet. Company's No. 4 Leonard State, C SW NE section 22-21-36, topped pay at 3,830 feet, total depth 3,905 feet, plugged back to 3,892 feet, acidized, reacidized, perforated casing, swabbed 79 bbls. of water and 3 bbls. of oil in four hours and was temporarily abandoned. Gulf Oil Corp. No. 2 Smith, C NE NE section 34-19-36, had pay at 3,870 feet, total depth 3,975 feet, was acidized and flowed 193 bbls. of oil in six hours. The No. 2-D Orcutt State, section 13-20-36, had pay at 3,778 feet, total depth 3,877 feet, acidized two times and flowed 258 bbls. of oil daily, cutting 1 per cent water.

Ohio Oil Co. No. 1 State-Hansen, section 16-20-37, flowed at the rate of 90 bbls. of oil through choke from pay at 3,812 feet, total depth 3,850 feet.

Oil Well Drilling Co. No. 1-A State, C NW NW section 16-22-36, found pay at 3,730 feet, was bottomed at 3,779 feet, shot and flowed 58 bbls. of oil in 13 hours, with 2,420,000 feet of gas.

Repollo Oil Co. No. 4-A Phillips, NW SW section 31-19-37, topped pay at 3,840 feet, total depth 3,910 feet, was acidized and flowed 175 bbls. of fluid in 24 hours, cutting 2 per cent water and 4 per cent basic sediment.

Shell Petroleum Corp. No. 2-M State, section 1-25-35, had pay at 3,760 feet, total depth 3,857 feet, and flowed 445 bbls. of oil in six hours, with 1,450,000 feet of gas.

Stanolind Oil & Gas Co. No. 1 Myers, section 22-24-37, found pay at 3,474 feet, total depth 3,552 feet, flowed 39 bbls. of oil in 24 hours with 4,166,000 feet of gas; was shot and flowed 58 bbls. of oil daily through choke.

Tide Water Oil Co. No. 1-J State, C SW NW section 17-19-37, flowed at the rate of 21 bbls. of oil hourly from pay at 3,930 feet, total depth 4,034 feet.

Amerada Petroleum Corp. No. 1 Dyer, section 31-25-37, an old well, was plugged back from 3,335 feet, total depth, to 3,213 feet, perforated casing, flowed at the rate of 18 bbls. of oil an hour and was recompleted.

Monument Area

Continental Oil Co. No. 16-C-1 State, C SW NW sec. 16-20-37. T.D. 3,809 ft.; rebuilt derrick; to deepen.
Gulf Oil Corp. No. 1 Bates, C SE SE sec. 26-19-36. T.D. 3,973 ft.; cleaning out.
Phillips Pet. Co. No. 1 Mexico-State, C NE NE sec. 30-20-37. T.D. 3,843 ft.; testing.
Phillips Pet. Co. No. 1 Quapaw-State, sec. 10-20-37. T.D. 3,862 ft.; testing.
Gulf Oil Corp. No. 1-C Kutter-State, C SE NE sec. 18-19-37. T.D. 4,026 ft.; to acidize.
Shell Pet. Corp. No. 4-K State, C NW NE sec. 36-20-36. Drlg. 3,819 ft.
Repollo Oil Co. No. 7 Barber, sec. 8-20-37. T.D. 3,840 ft.; preparing to run csg.
Continental Oil Co. No. 4-B-18 Britt, sec. 18-20-37. T.D. 3,866 ft.; testing.
Amerada Pet. Corp. No. 2-M State, sec. 13-20-36. T.D. 3,780 ft.; set 6⅝-in. 3,778 ft.
Amerada Pet. Corp. No. 2-Y State, sec. 17-20-37. Drlg. 3,657 ft.
Amerada Pet. Corp. No. 1-Z State, sec. 13-20-36. T.D. 3,783 ft.; set 6⅝-in. 3,778 ft.
Gulf Oil Corp. No. 8 Ramsey, sec. 17-20-37. Drlg. 480 ft.
Gulf Oil Corp. No. 3 White, sec. 25-20-36. Drlg. 1,897 ft.
Phillips Pet. Co. No. 2 Hobbs, sec. 18-20-37. Drlg. 3,300 ft.
Phillips Pet. Co. No. 3 Mexico, sec. 18-20-37. Drlg. 3,520 ft.
Atlantic Prod. Co. No. 1-O State, sec. 32-20-37. Drlg. 1,200 ft.
Empire O. & R. Co. No. 1 Persons, sec. 27-19-36. Rig.
Skelly Oil Co. No. 5 Van Etten, sec. 9-20-37. T.D. 1,168 ft.; set 9⅝-in. 1,158 ft.
Skelly Oil Co. No. 6 Van Etten, sec. 9-20-37. T.D. 3,780 ft.; set 7-in. csg.
Continental Oil Co. No. 17-A-4 State, C NE SW sec. 17-19-37. Drlg. 3,013 ft.
Amerada Pet. Corp. No. 3 Laughlin, C NW NE sec. 9-20-37. Drlg. 1,385 ft.
Continental Oil Co. No. 18-B-5 Britt, C SW SW sec. 18-20-37. T.D. 245 ft.; running csg.
Continental Oil Co. No. 11-A-5 Sanderson, NE SE SW sec. 11-20-36. Drlg. 3,302 ft.
Ohio Oil Co. No. 2 State-Hansen, C W½ SW NE sec. 16-20-37. Rigging up rotary.
Amerada Pet. Corp. No. 4-D State, sec. 1-20-36. Drlg. 3,270 ft.
Amerada Pet. Corp. No. 4-T State, sec. 25-19-36. Drlg. 2,955 ft.
Amerada Pet. Corp. No. 2-B Weir, sec. 25-19-36. Drlg. 1,025 ft.
Gulf Oil Corp. No. 4-F Bell-State, sec. 36-20-36. Derrick.
Gulf Oil Corp. No. 2-G Bell-State, sec. 13-20-36. T.D. 3,765 ft.; set 5½-in. 3,756 ft.
Gulf Oil Corp. No. 4 White, sec. 25-20-36. T.D. 3,850 ft.; to test.
Repollo Oil Co. No. 5 Byrd, sec. 11-20-36. Drlg. 3,055 ft.
Texas Co. No. 8 Lieu Lands, sec. 20-20-37. Drlg. 3,462 ft.
Phillips Pet. Co. No. 3 Hobbs, SW sec. 18-20-37. T.D. 1,091 ft.; set 9⅝-in. 1,074 ft.
Amerada Pet. Corp. No. 2-Q State, SE sec. 16-20-37. Drlg. 2,393 ft.
Texas Co. No. 3 Sanders, SE sec. 18-19-27. Drlg. 1,500 ft.
Texas Co. No. 9 Lieu Lands, NW sec. 19-20-37. Drlg. 137 ft.
Sun Oil Co. No. 1 Barr, SW sec. 24-19-38. Derrick.
Tide Water Oil Co. No. 2-T State, C NW NW sec. 17-19-37. R.U.R.
Gulf Oil Corp. No. 5 White, C NE NE sec. 25-20-36. Drlg. 727 ft.
Gulf Oil Corp. No. 5-F Bell, C SW SW sec. 36-20-36. T.D. 773 ft.; S.D.
Atlantic Ref. Co. No. 2-O State, NW sec. 32-20-37. Loc.
Gulf Oil Corp. No. 1 Butler, SE sec. 19-20-37. Cellar and pits.
Stanolind O. & G. Co. No. 3-A Gillully, NE sec. 25-20-36. Location.
Tide Water Oil Co. No. 1-K State, SW sec. 13-20-36. Loc.

Chaves County

J. & L. Drlg. Co. No. 1 Hurd, C SE NW sec. 14-11-26. Drlg. 1,310 ft.
English & Harmon No. 1 Billingslea, SE sec. 9-15-29. T.D. 2,695 ft.; to run csg.

Eunice Area

Getty Oil Corp. No. 1 State D, C SE NE sec. 32-20-37. T.D. 3,860 ft.; cleaning out.
Jim Murray No. 4 State-Wallace, sec. 3-21-36. Cellar.
Gulf Oil Corp. No. 1 Bell-Ramsey B, C SW SW sec. 29-20-37. T.D. 3,840 ft.; standardizing.
Tide Water Associated Oil Co. No. 1 Marshall, C SW NE sec. 13-21-36. T.D. 4,005 ft.; P.B. 3,770 ft.; S.D.
Ohio Oil Co. No. 6 McDonald, C SE SW sec. 16-22-36. Drlg. 3,417 ft.
Stanolind O. & G. Co. No. 1 Owen, NW sec. 3-22-37. T.D. 3,725 ft.; acidized.
Devonian Oil Co. No. 2 State, SE sec. 3-21-36. T.D. 3,843 ft.; P.B. 3,840 ft.; rigging up to pump.
Humble O. & R. Co. No. 1-G State, sec. 23-21-36. T.D. 3,860 ft.; to shoot.
Gulf Oil Corp. No. 2-E Bell-State, sec. 11-21-36. Drlg. 3,690 ft.
Gulf Oil Corp. No. 4 Campbell, sec. 7-21-36. Drlg. 3,025 ft.
Empire O. & R. Co. No. 1-G State, sec. 2-21-36. Drlg. 3,571 ft.
Gulf Oil Corp. No. 5 Collins, sec. 14-21-36. R.U.R.
Gulf Oil Corp. No. 8-C Orcutt, sec. 6-21-36. Drlg. 3,586 ft.
Stanolind O. & G. Co. No. 1 McQuatters, sec. 11-21-36. T.D. 3,847 ft.; to acidize.
Stanolind O. & G. Co. No. 1-A Langlie, sec. 11-21-36. T.D. 3,248 ft.; set 5½-in. 3,244 ft.
Humble O. & R. Co. No. 2-G State, C NE NW sec. 23-21-36. Derrick.
Stanolind O. & G. Co. No. 1 Hill, C Lot 15, sec. 5-21-36. Derrick.
Gulf Oil Corp. No. 4-C Arnott-Ramsey, sec. 21-21-36. Drlg. 3,780 ft.
Republic Prod. Co. No. 1 State, SE sec. 12-21-35. T.D. 254 ft.; set 13-in. csg. 245 ft.
Magnolia Pet. Co. No. 4 Carson, SW sec. 28-21-37. T.D. 1,350 ft.; W.O.S.T.
Gulf Oil Corp. No. 3 King, NW sec. 28-21-37. Derrick.

Dona Ana County

Juels C. Bertrand No. 1 Casad Permit, sec. 24-26-5e. T.D. 47 ft.; S.D.O.

Hobbs Area

Stanolind O. & G. Co. No. 9 State, sec. 9-19-38. T.D. 4,178 ft.; to reacidize.

Sims Area

Skelly Oil Co. No. 1 R. R. Sims C, C SE SW sec. 3-23-37. T.D. 3,388 ft.; pulling 7-in. csg.
J. E. Farrell No. 1-A Walden, C SW NW sec. 15-22-37. T.D. 3,746 ft.; testing.
Skelly Oil Co. No. 1 Sticher, sec. 4-22-37. T.D. 3,750 ft.; testing.
Gulf Oil Corp. No. 1 Davis, sec. 8-23-27. Drlg. 3,240 ft.
J. E. Farrell No. 2-B Walden, C NE SW sec. 15-22-37. T.D. 3,460 ft.; to kill well.
J. E. Farrell No. 2-C Walden, C SE SW sec. 15-22-37 T.D. 3,550 ft.; fishing.
Empire O. & R. Co. No. 2 Walden, sec. 21-22-37. Drlg. 2,250 ft.
Skelly Oil Co. No. 2 H. O. Sims, sec. 4-23-37. T.D. 3,400 ft.; waiting on tools.
Skelly Oil Co. No. 5 R. R. Sims, sec. 3-23-47. Drlg. 2,828 ft.
Tide Water Oil Co. No. 3 Walden, sec. 21-22-37. Drlg. 2,450 ft.
Skelly Oil Co. No. 2 G. W. Sims, sec. 9-23-37. T.D. 3,713 ft.; running tubing.
Continental Oil Co. No. 21-A-2 Elliott, C SW SE sec. 21-22-37. T.D. 3,366 ft.; set 7⅝-in.
Skelly Oil Co. No. 3 R. R. Sims, sec. 4-23-37. T.D. 3,670 ft.; C.O.
Skelly Oil Co. No. 4 R. R. Sims, sec. 4-23-37. Drlg. 3,593 ft.
Amerada Pet. Corp. No. 1 Corrigan, SW SW NE sec. 4-22-37. Drk.
Rowan Drilling Co. No. 1 Walden, C NW NW sec. 15-22-37. Drlg. 1,122 ft.
Gulf Oil Corp. No. 1 Baker, C SE SE sec. 5-22-37. Drk.
Skelly Oil Co. No. 3 H. O. Simms, NW sec. 3-23-37. Cellar and pits.
Rowan Drlg. Co. No. 1-A Elliott, SW sec. 27-22-37. Cellar and pits.

Cooper Area

Southern Oil Corp. No. 1 Gates, C SW NW sec. 23-24-26. T.D. 3,514 ft.; S.D. for orders.

Lea County—Miscellaneous

Brown & Reynolds No. 1 Parcell, C NW SE sec. 8-21-38. Wildcat; T.D. 4,397 ft.; P.B. 4,386 ft.; testing.
Amon G. Carter No. 2 Elliott, C NE SW sec. 22-22-37. T.D. 3,622 ft.; C.O.
Magnolia Pet. Co. No. 1 State G, NW NW NE sec. 24-17-34. T.D. 4,905 ft.; P.B. 4,794 ft.; C.O.
Continental Oil Co. No. 1 Wantz, C SW SW sec. 21-21-37. T.D. 3,872 ft.; running tubing.
Texas Co. No. 1 Alexander, sec. 5-21-37. T.D. 3,755 ft.; Testing.
Samedan Oil Co. No. 3 Hughes, sec. 4-23-27. T.D. 3,631 ft.; C.O.
Texas Co. No. 2 Black, sec. 21-24-37. Drlg. 3,345 ft.
Gulf Oil Corp. No. 1 Hardy, C SE SW sec. 20-21-37. T.D. 3,810 ft.; testing.
Anderson-Prichard Oil Corp. No. 1 Wells, C SE SE sec. 5-25-37. Drlg. 2,960 ft.
Herschback et al No. 1 Alston, C SW NE sec. 31-17-37. Drlg. 4,055 ft.
Williams & Cockburn No. 3 Miller, C SW SW sec. 23-17-32. T.D. 3,870 ft.; C.O.
Ohio Oil Co. No. 1 Grizzell, C SW SE sec. 5-22-37. Drlg. 3,705 ft.
Stanolind O. & G. Co. No. 2 Meyers, SW sec. 4-24-37. T.D. 3,432 ft.; set 5 5/16-in. 3,368 ft.
Stanolind O. & G. Co. No. 3 Meyers, SE sec. 4-24-37. Drk.
Gulf Oil Corp. No. 1 Boyd, sec. 23-22-37. T.D. 3,681 ft.; testing.
Gulf Oil Corp. No. 2 King, sec. 28-21-37. T.D. 3,800 ft.; testing.
Gulf Oil Corp. No. 1 Shahan, sec. 33-25-37. Wildcat; T.D. 3,150 ft.; set 5½-in. csg.
Gulf Oil Corp. No. 1 Woolworth, sec. 30-24-37. Wildcat; T.D. 3,217 ft.; gas: shut in.
Maljamar O. & G. Co. No. 3 Mitchell, C SE NE sec. 20-17-32. Drlg. 719 ft.
Texas Co. No. 1 Fristoe, C SW NW sec. 35-24-37. T.D. 3,501 ft.; set 7-in. 3,272 ft.
Stanolind O. & G. Co. No. 4 Meyers, sec. 22-24-37. T.D. 3,565 ft.; C.O.
Stanolind O. & G. Co. No. 5 Meyers, sec. 22-34-37. T.D. 2,501 ft.; P.B. to 2,040 ft.

Magnolia Pet. Co. No. 1 Hanna, sec. 7-26-38. Wildcat; drlg. 1,830 ft.
Empire O. & R. Co. No. 3-A Closson, sec. 6-22-36. T.D. 2,150 ft.; to recement pipe.
Gulf Oil Corp. No. 1 Knight, sec. 27-24-37. Drlg. 2,355 ft.
Harry Leonard No. 1 Siddall, sec. 6-20-38. Wildcat; drlg. 4,020 ft.
Shell Pet. Co. and Devonian Oil Co., No. 2 Christmas, sec. 21-22-36. Drlg. 3,734 ft.
Humble O. & R. Co. No. 1 Greenwood, sec. 92-2-37. T.D. 3,767 ft.; to run tubing.
Landreth Prod. Co. No. 2 Grizzell, sec. 5-22-37. T.D. 300 ft.; set 10-in. 290 ft.
Magnolia Pet. Co. No. 3 Cary, sec. 21-22-37. T.D. 1,300 ft.; W.O.S.T.
Repollo Oil Co. No. 1 Fowler, sec. 9-24-37. Drlg. 3,315 ft.
El Paso Natural Gas Co. No. 1 Camp, C SW SW sec. 6-24-37. T.D. 2,785 ft.; set 9⅝-in. 2,780 ft.
Schermerhorn Oil Co. No. 1 Woolworth, C NW NE sec. 28-24-37. T.D. 1,393 ft.; set 8⅛-in.
Gulf Oil Corp. No. 1 Westfall, SE SW SE sec. 15-25-37. T.D. 3,278 ft.; running csg.
Continental Oil Co. No. 1 Burger, C NW SW sec. 19-20-38. Drlg. 3,105 ft.
Culbertson-Irwin et al No. 1 Moseley, SE NE SW sec. 34-24-37. Drlg. 120 ft.
Continental Oil Co. No. 1-A-15 Cline, NW sec. 15-23-37. Wildcat; drlg. 910 ft.
Repollo Oil Co. No. 2 Christmas, sec. 28-22-37. T.D. 250 ft.; set 12⅛-in. 244 ft.
Repollo Oil Co. No. 1 Turner, sec. 29-21-37. Drlg. 365 ft.
Shell Pet. Corp. No. 1 Rinewalt, NW sec. 4-22-37. T.D. 1,219 ft.; set 9⅝-in. 1,213 ft.
F. J. Danglade No. 1 Christmas, C SE NE sec. 5-22-37. Drlg. 1,505 ft.
Devonian Oil Co. No. 2 Christmas, SE sec. 28-22-37. Cellar and pits.
Devonian Oil Co. No. 3 Christmas, C SW SE sec. 28-22-37. Cellar and pits.
Magnolia Pet. Co. No. 4 Cary, C NW SW sec. 21-22-37. Derrick.
Texas Pacific Coal & Oil Co. No. 4-A State, C SW SW sec. 9-22-36. Cellar and pits.
Texas Co. No. 2-A Rhoades, SE NW SE sec. 22-26-37. Rigging up rotary.
Stanolind O. & G. Co. No. 1 Turner, C NW NW sec. 20-20-38. T.D. 306 ft.; set 12⅛-in. 304 ft.
Ajax Drlg. Corp. No. 1 Lanehart, SW sec. 21-25-37. Rigging up machine.
Culbertson & Irwin No. 1 Boesche, NE sec. 2-21-32. Wildcat; location.
Gulf Oil Corp. No. 2 Westfall, SE sec. 15-25-37. Derrick.
Jal Natural Gas Corp. No. 2 Justis, NE sec. 20-25-37. Moving in material.
Mid-Continent Pet. Corp. No. 2 Greer, NW sec. 21-22-36. Cellar and pits.
Plains Prod. Co. No. 1 Humphreys, NE sec. 3-25-37. Loc.
Texas Co. No. 2 Lea, NE sec. 15-20-34. Loc.

Eddy County

Adams et al No. 1 Page, sec. 15-21-18. Wildcat; T.D. 100 ft.; S.D.O.
Republic Prod. Co. No. 7 Russell A, NW SE NW sec. 18-17-31. T.D. 3,535 ft.; testing.
Barnsdall Oil Co. No. 5 Dodd, sec. 22-17-29. T.D. 2,757 ft.; P.B. 2,730 ft.; shot 2,580-2,730 ft.; est. 60 bbls.
Flint Prod. Co. No. 1-B State, SE sec. 16-17-30. Drlg. 3,690 ft.
Murchison No. 1-B State, SE sec. 16-17-30. Drlg. 3,690 ft.
Carper Drlg. No. 2 Gissler, NW sec. 23-17-30. Loc.
Continental Oil Co. No. 1 Barrett, NW sec. 22-20-30. T.D. 1,957 ft.; S.D.O.
Repollo Oil Co. No. 1-D Parke, sec. 15-17-30. Drlg. 2,600 ft.
Flynn, Welch, Inc., No. 1-B Stevens, sec. 13-17-30. T.D. 3,010 ft.; set 5½-in. csg. 3,009 ft.
Neil Wills et al No. 1 Stovall-Wood, sec. 20-20-30. T.D. 1,435 ft.; swb. 125 bbls. oil daily.
Carlsbad Oil Co. No. 1 Pecos Irrigation, C NE SE sec. 15-25-28. Drlg. 350 ft.
Barnsdall Oil Co. No. 6 Dodd, sec. 22-17-29. Drlg. 2,460 ft.
Fred Brainerd No. 2 Brainerd, sec. 5-18-27. M.I.M.
Grayburg Oil Co. No. 3 Keely, SE NE NE sec. 24-17-29. Drlg. 2,140 ft.
F. W. & Y. Oil Co. No. 3 Jackson, C NW SE sec. 13-17-30. T.D. 575 ft.; showing water.
F. W. & Y. Oil Co. No. 4 Gissler, C SE SE sec. 14-17-30. Drlg. 2,215 ft.
F. W. & Y. Oil Co. No. 5 Gissler, C NE SE sec. 14-17-30. Drlg. 1,536 ft.
Harry Leonard No. 10 State, SE SW SW sec. 27-17-29. Drlg. 1,970 ft.
W. A. Nichols No. 1 Johnson, NE sec. 35-16-21. Wildcat; R.U.M.
F. E. Baker No. 4 Eddy, NE sec. 12-22-27. T.D. 55 ft.; M.I.M.
Alscott Oil Co. No. 1 Goodale, SW NW SE sec. 30-18-29. M.I.M.
H. & W. Drlg. Co. No. 1 Danford, C SE SE sec. 9-22-29. M.I.M.
Neil H. Wills et al No. 1 Morris Hoover, C SW NW sec. 20-20-37. M.I.M.
Franklin Pet. Corp. No. 1 Nelson, NW sec. 4-18-30. Wildcat; spudded.
Pool Oil & Gas Co. No. 1 Reed, SW sec. 28-24-28. Wildcat; spudded.

Roosevelt County

Dummit Oil Co. No. 1 Todd, SE SE sec. 34-3n-29. T.D. 656 ft.; S.D.

Otero County

George Muldey No. 1 State, SW cor. sec. 11-25-8e. T.D. 263 ft.; S.D.
Fred Turner No. 1 Hattie Evans, NW NW SW sec. 22-14-12. O.W.D.D.; wildcat: drlg. 2,330 ft.

Curry County

Bond & Harrison No. 1 Hart Ranch, C NW SE sec. 13-2n-31. T.D. 1,246 ft.; W.O.S.T.

McKinley County

S. Dysart No. 1 Government, NE sec. 14-14-10w. T.D. 1,390 ft.; fishing.

COLORADO

Adams County

Glenridge Oil Co. No. 1 Hills, SE SE SE sec. 27-3s-64w. T.D. 4,345 ft.; pipe recovered; W.O. new string.

Bent County

Indian Territory Illuminating Oil Co. and Olson Drlg. Co. No. 1 Arbes, C Lot 2, sec. 2-21s-48w. M.I.M.

Boulder County

Boulder Prod. & Dev. Co. No. 1 Harlow Est., SE NE sec. 36-2n-71w. Drlg. below 150 ft.

Cheyenne County

Brittel Oil, Inc., No. 1 Seip, C NE SW sec. 26-12s-47w. Cmtd. 18-in. at 100 ft.; drlg. ahead, daylight only.

Larimer County

Location has been leased for a test well in the Berthoud area in the Great West Oil & Gas Corp. No. 1 Haworth, C SW SE section 16-4n-69w. The company is a Delaware corporation. A. C. Caroway is president and Alex Pollock, of Denver, vice president.

Great West O. & G. Co. No. 1 Haworth, C SW SE sec. 16-4n-69w. Loc.; to spud by June 1.
L. D. Charboneau et al No. 1 Thompson, C NE sec. 12-4n-70w. Drlg. 153 ft.

Grand County

Interstate O. & R. Co. No. 1 Hinman, NE SE NW sec. 11-2n-81w. T.D. 1,997 ft.; resuming.

Huerfano County

S. W. Pressey No. 1 Ojo, SW NE sec. 10-29s-69w. Drlg. 3,350 ft. after lowering 5⅞-in. to bttm. to S.O. cavings caused by gas; Dakota expected 3,900 ft.

Lincoln County

The Gulf Oil Corp. has taken leases on between 6,000 and 7,000 acres in the Rush Creek district in eastern Lincoln County. It is mostly protection acreage and no special significance is attached to the deal at this time.

Consolidated Smelting & Metals Corp. No. 1 Hancock, NE NE SW sec. 7-17s-52w. S.D. 2,450 ft. for engine repairs.

Moffat County

Morapas Pet. Co. No. 1 Coles, SW SW SE sec. 1-3n-92w. Drlg. 635 ft.
Mountain Fuel Supply Co. No. 1 Donnell, C SE NE sec. 31-12n-97w. Drlg. 4,400 ft.; prep. to test.
Anderson-Kerr Drlg. Co. et al No. 1 Denise, C SE SE sec. 19-9n-99w. T.D. 2,240 ft.; rng. 10-in. to bttm.
Anderson-Kerr Drlg. Co. No. 1 Marrs, C SE NE sec. 17-11n-100w. Prep. to M.I. company tools.

Morgan County

Swisher et al No. 1 Lunt, SE cor. sec. 3-4n-60w. T.D. 1,718 ft.; W.O. shooter.

Park County

South Park Oil Co. No. 1 Lemar, NE NE SE sec. 34-11s-75w. T.D. 4,567 ft.; redrlg. at 4,142 ft.

WYOMING

Albany County

Murphy Oil Co. No. 7 Holst, NE NE SE sec. 13-17n-77w. Drlg. 1,717 ft.
Hal Blakeman No. 1 Chapple, C NE NW sec. 33-21n-76w. C.O. to bttm. at 1,681 ft.
Murphy Oil Co. No. 1 Holst-Woolf, NW NW NW sec. 19-17n-76w. T.D. 4,067 ft.; tstg. Dakota through perforated 7-in.

Big Horn County

Ohio Oil Co. No. 2 Byron-Baker, SW NW sec. 23-56n-97w. Loc.; (first report).
Stock Oil Co. No. 1 Stock-Jones, SE cor. sec. 52-56n-97w. Spdg.
Ohio Oil Co. No. 1 Pryde, C SW SE sec. 24-56n-97w. Drlg 1,560 ft.
Ohio Oil Co. No. 1 Smith, NE cor. Lot 61, sec. 33-56n-97w. Drlg. 2,205 ft.
Woods-Callahan Oil Co., Ltd., and Wyoming O. & R. Co. No. 1 Evans, NE NE NW sec. 12-44n-91w. M.I. rot. rig from California.

Campbell County

G. J. Sherin et al No. 1 Rodes, NE SE SW sec. 24-49n-74w. Drlg. 500 ft.

Carbon County

The Medicine Bow Oil Co. No. 1 Hintze-Government, which marks a 4-mile extension of the Allen Lake gas field in the upper Sundance, tested 5,000,000 feet of gas at 2,180 feet, total depth, after scraping and enlarging hole below the 7-inch at 2,113 feet. The well made 25,000,000 feet in the upper Sundance which was cased off. It will be deepened a little and again tested for oil.

The Ohio Oil Co.-California Co. have two near-completions in the Big Medicine Bow field. No. 2 Kyle is testing at 5,668 feet, total depth. It had the first Sundance at 5,473-5,554 feet and the second Sundance at 5,656-68 feet. Their No. 4 Union Pacific, an east offset to No. 2 Kyle, went to 5,617 feet and found water in the lower Sundance at 5,544-5,617 feet. It plugged back to 5,475 feet and cemented the 7-inch at 5,412 feet to test the first horizon.

Ohio Oil Co. No. 6 Diamond Cattle, NW NW sec. 35-20n-78w. T.D. 3,334 ft.; P.B. to 3,321 ft. swbg. 25 B.W.P.D. and some oil.
Medicine Bow Oil Co. No. 1 Hintze-Govt., C NE SE sec. 18-22n-78w. T.D. 2,180 ft.; tstg.
Ohio Oil Co.-California Co. No. 2 Kyle, C SE SE sec. 26-21n-79w. T.D. 5,668 ft.; tstg.
Ohio Oil Co.-California Co. No. 4 Union Pacific, C SW SW sec. 25-21n-79w. T.D. 5,617 ft.; P.B. to 5,475 ft. to test upper Sundance.
Ohio Oil Co.-Medicine Bow Oil Co. No. 1 U. P.-Wister, C NW SW sec. 17-22n-78w. R.U. ready to spud.
Ohio Oil Co. No. 8 Dixon, SE NE SE sec. 34-20n-78w. Drlg. 3,733 ft.

Converse County

Elbe Oil Ld. & Dev. Co. No. 1 Benham, NW NE sec. 5-31n-70w. M.I.M.; (first report).
Tom Carney No. 1 Beaver, SE SE SW sec. 28-35n-68w. M.I.M.
Chadron-Osage Oil Co. No. 1 State, SW cor. sec. 16-32n-69w. Drlg. 3,400 ft. in Lower Pierre or Upper Niobrara.
Wyoming Southern Oil Co. No. 1 Evert, NW NW SW sec. 26-32n-69w. Drlg. below 50 ft.

Fremont County

H. Kenyon Burch No. 1, CEL NE NE sec. 28-3n-1w. Spdg. 75 ft.; (first report); Pilot Butte dist.
Ben Stewart No. 1 Darnell, NE SE sec. 26-3n-1w. M.I.M. to test Frontier at 600 ft.; 1½ mi. E of Pilot Butte wells.

Johnson County

Carter Oil Co. No. 3 Rider, C NW SE sec. 17-48n-82w. R.U.

Lincoln County

H. M. Eller et al No. 4 Govt., SE NW SW sec. 32-19n-116w. T.D. 401 ft.; will test S.O. in lenticular sd. at 397-401 ft.
Place Oil Co. No. 1 Davis, SE SE SE sec. 9-26n-113w. T.D. 870 ft.; rng. 8¼-in. to 808 ft. to S.O.W. and test oil show.

Natrona County

Stanolind O. & G. Co. No. 1 T.P., C NW SE sec. 26-40n-79w. Spdg.
Wyalta Oil Co. No. 4 Govt., NW NW sec. 5-29n-81w. Cmtd. 6⅝-in. on top of Sundance at 1,082 ft.; rng. 2-in. tbg. to test at 1,030-72 ft.

LINK-BELT *Anti-friction* BEARINGS

IDEAL FOR OIL FIELD SERVICE

● The Link-Belt power transmission line is built to meet today's needs.

Anti-friction . . . inherent self-alignment . . . streamlined . . . the ideal combination for lower power consumption — longer service life — less lubrication—minimum maintenance expense. Anti-friction bearings in Link-Belt streamlined mountings. Send for catalog.

LINK-BELT COMPANY 0022
2410 W. 18th St., CHICAGO DALLAS HOUSTON LOS ANGELES OKLAHOMA CITY, (W. H. Abele, Box 305, Rt. 4)

Wyalta Oil Co. No. 5 Govt., SW SW sec. 30-30n-81w. Tstg. at 1,021 ft.
Wyalta Oil Co. No. 6 Govt., NE SE NW sec. 5-29n-81w. Cmtd. 10-in. at 704 ft.; Dakota at 565-664 ft.

Niobrara County

The Lance Creek area had two developments of far-reaching possibilities this week. The Ohio Oil Co. No. 5 Leo OPC-16, located three-fourths of a mile east of the nearest producing well in the Sundance sand, which is a deep test to the Tensleep, cemented the 7-inch at 5,500 feet to make a test. At this depth it had a show of oil which warranted the running of the production string. It will drill into the Tensleep next week. This operation was made into a mystery well after it entered the top of the red beds. It is 2¾ miles east of same company's No. 5 Putnam, the only other well drilled to the Tensleep and about which no information was given out, but which was believed to be about a 4,000-bbl. well making high gravity oil. Should the second deep test prove productive it will mean that the Tensleep horizon will be productive over a much larger area than the Sundance horizon in which reserves of 30,000,000 bbls. have been proven.

The second development of importance is that the Continental Oil Co. has made a location for a test of the East Lance Creek area in its No. 1 Leach, SW NE NE section 29-36n-64w, 5 miles to the east and a little north of the nearest Sundance sand producer in the Lance Creek field. The location is only half a mile from the Argo well in section 28 which has been producing for about 18 years from a Dakota sand. Wells to the north and south of the Argo well failed to show anything of value. No Sundance test was drilled in that area. The Continental well is scheduled to spud by June 15. The company placed on record leases of a large block in that area which gives it the cream of the acreage.

Continental Oil Co. No. 1 Leach, SW NE NE sec. 29-36n-64w. Loc.; (first report).
Argo Oil Co. No. 4 Ford, SW NW SE sec. 33-36n-65w. R.U.
Argo Oil Co. No. 3 Ford, SW SW NW sec. 33-36n-65w. R.U. to deepen from 3,990 ft.
Ohio Oil Co. No. 2 Putnam, NE SW NW sec. 4-35n-65w. Drlg. 4,097 ft. in second Sundance; top at 4,085 ft.
Ohio Oil Co. No. 2 Richards & Comstock, C NE SW sec. 32-36n-65w. T.D. 3,783 ft.; base second Sundance 3,778 ft.; W.O. 4¾-in.
A. B. Cobb and Holly Dev. Co. No. 2 Novick, SE SE SW sec. 6-35n-65w. Drlg. 2,980 ft.
Continental Oil Co. No. 4 Schuricht B, NW SW SE sec. 6-35n-65w. Cmtd. 13⅜-in. at 270 ft.; W.O.C.
Continental Oil Co. No. 8 Otto Rohlff, SW SW SE sec. 31-36n-65w. W.O. drk.
Continental Oil Co. No. 10 Tom Bell Cattle, C SW NW sec. 34-36n-65w. Drlg. 3,450 ft.
MacKinnie Oil & Drlg. Co. No. 2 Thompson, NW NW NE sec. 7-35n-65w. Drlg. 2,550 ft.
J. M. Huber Corp. No. 1 Lamb, SE SE SW sec. 27-36n-65w. T.D. 3,910 ft.; P.B. to 1,485 ft.; drlg. 1,497 ft. in new hole.
Ohio Oil Co. No. 5 Leo, NW NW SW sec. 35-36n-65w. Cmtd. 7-in. at 5,500 ft.; W.O.C.

Park County

Resolute Oil Co. No. 1 Northern Pacific, C NE NW sec. 21-57n-101w. R.U.R.; (first report).
Kinney-Coastal Oil Co. No. 3 Govt., SW NW NE sec. 24-56n-97w. T.D. 4,338 ft.; R.U. to deepen.
Resolute Oil Co. No. 1 Govt., C NE NE sec. 20-57n-101w. Drlg. 1,700 ft.
General Pet. Corp. No. 1 Govt., NW NW NW sec. 33-47-100. T.D. 6,076 ft.; prep. to test.

Platte County

Dividend O. & R. Co., Inc., No. 1, CSL NW SW sec.17-24n-66. Resuming at 2,385 ft.

Sweetwater County

Mountain Fuel Supply Co. No. 1 Stone, C SW SW sec. 18-19n-103w, North Baxter Basin. R.U.R.; (first report).
Mountain Fuel Supply Co. No. 3 Union Pacific, SE NE sec. 15-16n-104w. Drlg. 2,100 ft. with cable tools.

Uinta County

E. A. Ottman et al No. 1 Govt., C SE NW sec. 26-14n-119w. M.I.M. for cable tool test to Bear River form. at 1,600 ft.

Washakie County

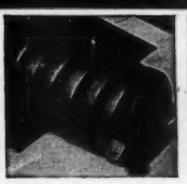
Arlton & Doyle No. 1 Govt., SW SW SE sec. 29-48n-91w. T.D. 1,356 ft.; prep. to resume.
Yale Oil Corp. No. 2 Govt., CEL SE SE sec. 25-48n-91w. Loc.
Bruce Teeter No. 5 Govt., CSL SW SW sec. 30-48n-90w. Drlg. 100 ft.; 10-in. at 85 ft.
Christensen & Thorne No. 3-X Govt., NW SW SW sec. 31-48n-90w. Drlg. sh. 860 ft.
Wyoming O. & R. Co. No. 8 Govt., NW NE NW sec. 31-48n-90w. Drlg. 200 ft.; 10-in. at 79 ft.
Wyoming O. & R. Co. No. 7 Govt., SW NW NW sec. 30-48n-90w. Drlg. bl. sh. 710 ft.; 10-in. at 87 ft.

Weston County

Two wells were completed in the Osage field. R. L. Rose No. 7, C SW SE section 8-46n-63w, was dry at 350 feet. Henry Egert's No. 5, CEL NE SE section 8-46n-63w, pumped 5 bbls. per day from sand at 310-335 feet. There are no other active drilling operations in the

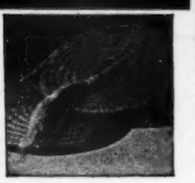
THE RIGHT PACKING in the Right Place!

J-M Sea Rings. Absolutely automatic. Save power. Reduce wear on equipment. Last longer.



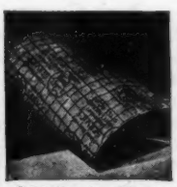
J-M Kearsarge Rod Packing. Retains its efficiency—note construction of center block.

J-M Centripac. Plaited construction. Specially designed for centrifugal service.



J-M Flax Packings available in various styles to meet a wide variety of service conditions.

J-M Kearsarge Boiler Gaskets assure a perfect seal on handholes, manholes and tube plates.



J-M Service Sheet. Pliable. Resilient. Adaptable to all general sheet packing purposes.

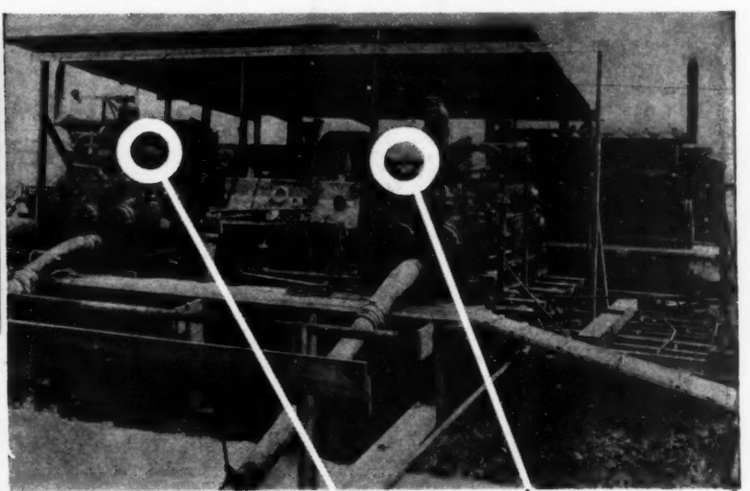
J-M Mogul Packing. An excellent utility packing for general service.

FOR *complete* information on J-M's *complete* line of packings for the oil industry, send for the J-M Packings Catalog. Address Johns-Manville, 22 East 40th St., New York City.

Johns-Manville PACKINGS

For Every Oil Industry Service

JM

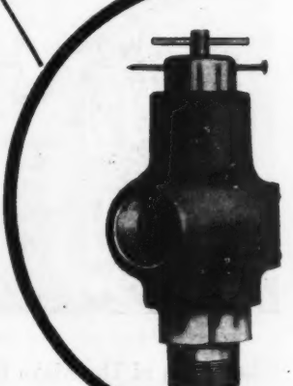


SHEAR-RELIEF

MEANS SURE RELIEF FOR PUMP OVER-PRESSURES

There's no guess work about the action of the ABERCROMBIE SHEAR-RELIEF Valve when pump pressure reaches the shear point of the nail with which it is set. The nail shears every time, at the figure shown on the valve name plate for this size nail. The valve piston immediately moves into open position, releasing the flow of fluid through the outlet. Material in the piston, plus valve design, prevents any sticking. All damage is confined to the sheared nail, and another nail is the simple answer to SHEAR-RELIEF Valve resetting.

So, it's easy to see the positive protection the two SHEAR-RELIEF Valves are giving to the slush pumps pictured above on the modern Diesel-Electric drilling job.



FLUID-PISTON SLUSH PUMPS
ABERCROMBIE PUMP CO.
GULF BLDG. HOUSTON TEX.

field. The drilling program for the summer has largely been abandoned and a revival will come only if a dependable market is assured. Refiners have been taking the current production during May, but some stored oil remains in the field. Refiners report a slack demand for products.

R. L. Rose No. 7, C SW SE sec. 8-46n-63w. S.D. 250 ft.

MONTANA

Big Horn County

Big Horn O. & G. Co. No. 31, CWL SE NW sec. 23-1s-33e. Drlg. 625 ft.
Daniels Pet. Co. No. 1 May, C SE SE sec. 13-1s-33e. Drlg. 3,900 ft. with 2-in. bit.

Carbon County

Ohio Oil Co. No. 16 Kirt, C SE SE sec. 4-7s-21e. R.U.R.

Fallon County

Nagasco Corp. No. 1, C SE sec. 24-5n-6e. Drlg. 720 ft.

Glacier County

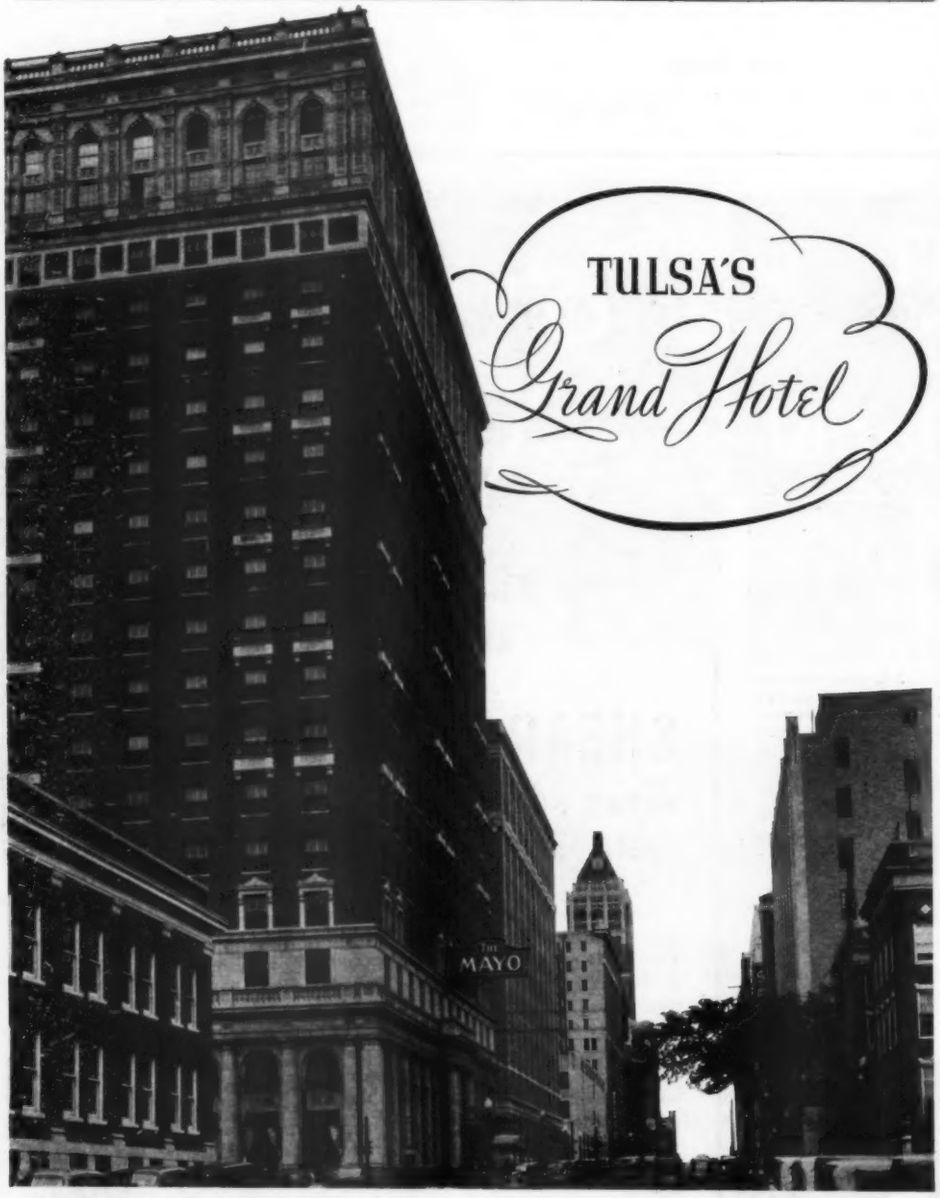
There were three completions and four new operations in the Cut Bank field. One of the completions showed up better than the average. This was the Glacier Production Co. No. 1 Carrigeaux, NW NW NW section 21-33n-5w, which was completed at 2,967 feet and swabbed 276 bbls. first 24 hours from the Cut Bank sand at 2,923-66 feet. The Sunburst at 2,845-55 feet was dry. Elevation 3,872 feet.

The Glacier Production Co. No. 2 Fuller, C NW SE section 17-33n-5w, swabbed 95 bbls. first 24 hours at 2,967 feet from the Cut Bank at 2,940-66 feet. The Sunburst at 2,875-95 feet had a show of oil. The 7-inch was cemented at 2,918 feet and 658 feet of 5½-inch liner was set on bottom. Elevation 3,869 feet.

The Dakota-Montana Oil Co. No. 1 Tribal-136, C NE NE section 15-34n-6w, swabbed 45 bbls. first 24 hours from the Cut Bank at 2,903-45 feet. Total depth is 2,960 feet. There was no Sunburst sand.

Montana Headlight Oil Co. No. 5 Britton, SE SW NE sec. 14-34n-6w. Drlg. 300 ft. (first report).
R. C. Tarrant No. 4 Reickhoff, NE NE SE sec. 22-32n-6w. Bldg. rig (first report).
Glacier Prod. Co. No. 2 State-16, SW SW SW sec. 16-33n-5w. Loc. (first report).
Glacier Prod. Co. No. 2 Neill, NE NE NE sec. 20-33n-5w. R.O.G. (first report).
Texas Co. No. 4 Sec. 9 Unit, C NE NW sec. 9-32n-5w. M.I.M.
Texas Co. No. 2 Hardwick, C NE SE sec. 17-32n-5w. Loc.
Texas Co. No. 1 Lennon, C NW SE sec. 24-33n-6w. Drlg. 393 ft.
A. E. Wilkinson No. 3 All.-127, C SE SE sec. 1-32n-6w. R.O.G.

(Continued on Page 198)



The charm of The Mayo is unsurpassed among hotels of the Southwest. Its cosmopolitan atmosphere is inviting to the most fastidious guest. You live . . . you dine . . . and above all you rest. . . . There is little wonder that our guests always come back . . . It's a *"Grand Hotel."* All rooms with bath, from $2.50 up.

THE MAYO
TULSA, OKLAHOMA

Kansas Fields

(Continued from Page 181)

SW section 23-26-12, wildcat, had a hole full of water at 2,000-10 feet, total depth, was abandoned.

Spencer No. 1 Wahl, C S half SW SW section 32-23-13, had Mississippi lime at 1,654 feet, total depth 1,689 feet, and was dry and abandoned.

New work in Greenwood County: Landon and others No. 5 Weber, C NW SE section 9-25-13, drilling at 560 feet; Seven-Eleven Oil Co. No. 1 Evans, SE NW NW section 7-22-10, drilling at 1,200 feet.

Harvey County

E. J. Shaffer and others No. 1 Steele, NW NW SE section 12-23-2w, Harvey County, had Siliceous lime at 3,580 feet and was dry and abandoned at 3,615 feet, total depth.

Hollow and Bradley Brothers No. 1 Neufeldt, NE SE NW section 17-22-1w, wildcat, was a rig.

Woodson County

C. L. Sheedy and others No. 1 College, NW NE SE section 28-25-14, Woodson County, had sand at 1,440-80 feet, total depth, was shot and pumped 150 bbls. of oil in 24 hours.

Kansas Oil & Gas Corp. No. 1 Providence Institute, SW SW SE section 6-24-15, wildcat, had lime at 1,545 feet and was dry and abandoned at 1,643 feet, total depth. This well originally was listed as Katz and others No. 1 Guy.

Aikman & Braden No. 2 Massey, C N half SW SE section 35-23-14, was a machine.

Gillespie & Sons No. 1 Shotwell, SE SW SE section 14-23-14, in Coffey County, just north of the Woodson County line, was a rig.

Chautauqua County

Sagamore Oil & Gas Co. No. 3-B White, C SE NW section 15-32-12, Chautauqua County, had lime at 1,607 feet, total depth 1,682 feet, and produced 250,000 feet of gas.

First reports of new work in Chautauqua County: F. S. Craver No. 1 Floyd, NW SW SE section 26-33-12, moving in machine; Beeler & Cavert and others No. 1-A Graham, C S half SE NW section 29-33-12, spudded; Craft No. 1-A Lagree, SE NE NW section 8-32-12, had Mississippi lime at 1,600-67 feet, underreaming; C. L. Brosius and others No. 1 Garrett, NW SW NW section 26-32-11, wildcat, spudded; Buffington & Cohen No. 1-A Hayes, SE NE SE section 10-33-13, wildcat, drilling at 1,025 feet.

Rush County

Schoenfeld & Kitch No. 1 Suppes, SW cor. section 14-16-16w, Rush County, topped Kansas City lime at 3,249 feet, had a slight showing of oil at 3,249-50 feet, and was dry and abandoned at 3,446 feet, total depth.

W. W. Kiskaddon and others No. 1 Ham, SW SW NW section 25-17-19w, wildcat, was a location. Carter Oil Co. and others No. 1 Prosch, C N half N half SE section 21-18-16w, wildcat, was rigging up rotary.

Other First Reports

Atlantic Refining Co. No. 1 Griffith, C NE SW section 14-20-33w, Scott County, was rigging up rotary.

Union Oil & Refining Co. and others No. 1 Howell, SW cor. section 6-29-1e, wildcat in Sedgwick County, was a cellar.

W. M. McKnab No. 1 Blair, SW cor. section 7-30-1e, Sumner County wildcat, was a location.

In Elk County, Diller Oil & Gas Co. No. 1 Miller, NW NE SW section 25-31-10, was a location; same operator's No. 6 Key, C N half SW NW section 25-31-10, had dug ponds; Hicks Drilling Co. No. 5 Lewis, C S half S half SE section 35-31-10, was rigging up machine; G. T. Berry No. 1 Zimmerman, SW NE SE section 15-30-10, wildcat, was drilling at 375 feet.

In Pratt County, Atlantic Refining Co., Empire Oil & Refining Co. and Skelly Oil Co. No. 1 Runyon, SW NW NE section 11-27-13w, was a wildcat location.

In Barber County, Colonial Oil Co. No. 1 J. W. Blunk Estate, NE cor. section 13-34-14w, wildcat, was moving in material; W. I. Southern, Inc. No. 1 Davis, SE SE NE section 24-34-15w, wildcat, was a rotary rig.

West and North Texas

By
L. E. BREDBERG

IMPORTANT DISCOVERY MADE NEAR ROTAN, FISHER COUNTY

FORT WORTH, Tex., May 24.—An important event of the week in the eastern part of the West Texas district was the strike made by Southern Oil Corp. (S. C. Yingling, Dallas) on the Joe Robinson lands, NE quarter section 72, Block 2, H.&T.C. Survey, about 2½ miles northeast of Rotan in northern Fisher County. This new discovery logged a Dolomite pay about 50 feet below the Noodle Creek lime, 200 feet above the pay found in the Royston field in the same county, and about 300 feet above the pay found in the Howard pool, about 3 miles farther northeast. The pay was first reported as a sand, then a lime, but the only oil horizon in the area with which it correlates was that found in the old Stebbinger No. 1 Hicks, to the east in Jones County, at around 1,600 feet. That test, however, made a failure, although it logged a good showing of oil. The Southern Oil Corp. well undoubtedly opens a new pay horizon for that sector of the district, and therefore will result in wildcat drilling in search of other pools there. Leasing and royalty buying began in the county as soon as the discovery was reported.

The pay was topped at 3,502 feet, total depth 3,505 feet, where the well has been flowing through casing and a defective control head into slush pits until 3,600 bbls. of steel storage could be erected. The well is estimated good for from 1,000 to 3,000 bbls. per day, the oil testing 40.7 degrees in gravity, the highest grade oil found in Fisher or Jones County.

The National Petroleum Corp. and Southern Oil Corp. are headed by S. C. Yingling of Dallas. This well has been carried on reports as that of the Southern Oil Corp., which held a block of between 3,000 and 3,500 acres in the area, having sold spreads to Magnolia Petroleum Co., Tide Water Associated Oil Co. and others. The Magnolia also holds considerable acreage in the area under older leases. General Crude Oil Co. (Pew interests) also hold a spread around the well, the potential of which may be raised by treatment with hot acid.

Pipe Lines Nearby

The Humble Pipe Line Co. and Shell Pipe Line Co. both have lines in the vicinity of the new well. Tide Water and Magnolia will be forced to drill east offsets. Magnolia also holds the quarter section to the west, in section 171.

The three wells in section 180, 3 miles to the northeast, are only pumpers, consequently have not created any kind of a drilling campaign on the block held by Tide Water Associated Oil Co. and Merry Brothers and Perini, but as the former company holds acreage practically connecting the new with the old area, it will undoubtedly drill tests on these leases in quest of production from the shallower pay horizon.

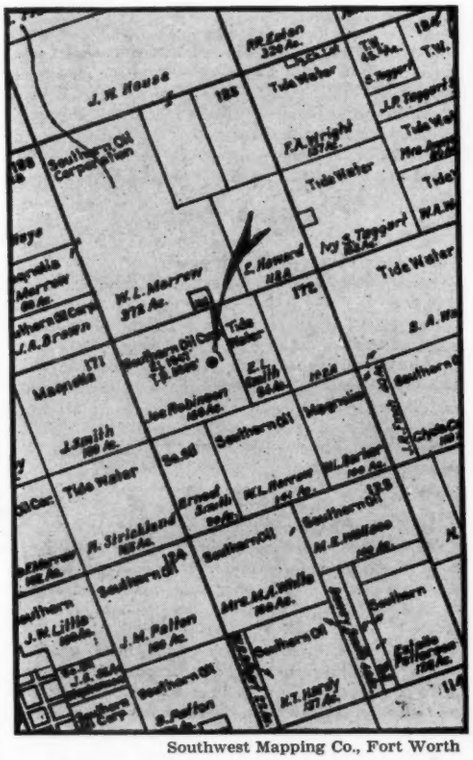
Abandonment

The wildcat test 3 miles west of Fort Stockton, in Pecos County, drilled by E. R. Minshall on the Banker lands, in section 25, Block 146, T.&St.L. Survey, which several months ago showed for a small producer, has been abandoned at a total depth of 2,974 feet after plugging back from 3,005 feet and trying to make a commercial producer. Elevation is 3,090 feet.

Grisham-Hunter, Inc.'s test on the Montgomery lands in section 1, W. R. King Survey, near the town of Toyah in Reeves County, was given up at a total depth of 4,065 feet. Elevation is 2,891 feet. It was previously plugged back to 4,058 feet to shut off water and shoot from 3,940-4,053 feet, which was of no avail, the Delaware sand failing to "pay off."

Humble Acquires Big Block

The Humble Oil & Refining Co. within the past two weeks has taken a 10-year lease on the ranch of the late T. B. Yarbrough and Glenn Allen in the northwestern part of Crane, southwestern Ector, southeastern Winkler and northeastern Ward counties. An Ordovician test is expected to be put down on the ranch in the future. A dry Permian lime test is already located on the block in southwestern Ector, and this block lies on the south-north trend, with an Ellenberger producer and two Simpson producers located to the south in the Sand Hills field in western Crane. Wilcox Oil & Gas Co. is preparing to drill a deep test on a block in the extreme northwestern corner of Crane County, which may have some influence on a



Southwest Mapping Co., Fort Worth

Southern Oil Corp.'s new discovery 2½ miles northeast of the center of Rotan in Fisher County, which is estimated as a 1,000- to 3,000-bbl. well

test on this newly acquired block. L. C. Link of Midland, leased the block for Humble.

Loving Loses

The Mason or Kyle field, recently uncovered in the northwestern part of Loving County by the Mason Oil Co. on the Kyle ranch, has received a setback. Stanolind Oil & Gas Co. No. 1 Kyle, a south offset to the discovery well, both of which are in section 20, Block 55, Township 1, T.&P. Survey, is standing at 3,930 feet, elevation of 3,069 feet, with salt water drowning out prospects of oil production after shooting with 190 quarts at 3,845-3,917 feet.

Another Gaines Test

In northwestern part of Gaines County, in which several wildcat tests are now going down, Continental Oil Co. will drill a test in section 46, Block AX, P.S.L. Survey, in an area in which Amon G. Carter is already drilling two wells. The location is about midway between the two Carter tests which are only 3½ miles apart, one in section 44 and the other in section 48.

Amon G. Carter has staked location for an extreme wildcat in the Edwards Plateau region, spotting it on the F. D. Sweeten ranch, in section 48, Block 2, B.&B. Survey, 1½ miles east of the town of Rock Springs. It is to be drilled to 7,000 feet. The publisher-operator has held a block in this area for some time but sold spreads in it to other operators.

On Down to Ordovician

The Gulf Oil Corporation failed to make a Permian lime producer of No. 2 McKnight, in section 9, Block B-21, P.S.L. Survey, northeast of a small Permian pumper, and is carrying the hole down in quest of production from the Simpson or Ellenberger, which is paying off in three wells 4 miles to the south in the Sand Hills field in western Crane County. Its distance from those Ordovician producers makes this an extremely interesting test, as it will either prove a deep field covering territory that distance to the northeast, or define it on that side of the compass. It is now drilling below 5,100 feet. Two other deep tests are drilling in this area, one by Sinclair Oil Co. and five other major companies, and one by Gulf Oil Corp.

Bailey Block

George Etz of Roswell, N. Mex., and E. H. Robertson of Lubbock, have staked location for another extreme wildcat in the northern sector of the West Texas district. It is on a block of 9,600 acres recently assembled in the south central portion of Bailey County, in the center of Tract 66, League 182, Floyd County School Lands. It is to be drilled to 5,500 feet in quest of production in the Big Lime. Several major companies, including Sinclair Prairie Oil Co., Magnolia Petroleum Co., Ohio Oil Co. and others, have taken spreads in the block.

Means Extension

The Means field in northeastern Andrews County was extended another half mile to the west when Sun Oil Co. No. 1-C Means, in section 13, Block A-35, P.S.L. Survey, logged oil and gas at 4,325-4,507 feet and shut down at 4,537 feet to shoot with 530 quarts of nitroglycerin at 4,235-4,507 feet. It flowed 75 bbls. through casing with 2,500,000 feet of gas the first three hours on test, after shooting.

WEST CENTRAL AND NORTH TEXAS

Apparently a new pool has been opened in Clay County in the North Texas district, and another and deeper pay horizon has been found north of St. Jo, in Montague County, according to reports coming from these areas. Walter Gant of Ardmore, Okla., drilled the Clay County well, on the C. M. Worsham lands, in section 38, Block 4, H.&T.C. Survey. It is 6 miles southwest of Ringgold in the southeastern portion of the county, and about 2,500 feet northwest of a small pool opened by the Gulf Oil Corp., which previously developed three producers and three dry holes. The wells produced at 3,300-3,500 feet in sand, but went to water and were plugged. This new well topped the sand at 3,915 feet, drilling 12 feet in, when it was shut down making considerable gas and being estimated good for 200 bbls. of oil per day.

Benton and Holmes seems to have opened a deeper pay on the Reed lands in the A. T. Robinson Survey, Abstract 631 in Montague County, after drilling their No. 4 Reed to 2,328 feet, after topping the sand at 2,320 feet. It was shut down to run 5-inch casing and test. Later the plug was drilled and the well started to flow at more than 250 bbls. per day. This sand is about 450 feet below the next deepest producing level in the field.

Three miles northeast of Oplin, southwestern Callahan County, Hal Hughes of Abilene is planning on sink-

ing a 4,500-foot Ordovician rotary test on the Tom Poindexter lands, in the George Hancock Survey, and about 1,000 feet south of a dry hole drilled last year.

Hickey and others are preparing to drill a 3,200-foot wildcat on the W. M. Martin farm, in the D. J. Miller Survey, 2 miles southeast of Desdemona, in Erath County. A 7,000-foot test is also getting under way in that area, but over the line in Comanche County. N. D. Gallagher and others are to drill it.

F. Craig Morton, of Abilene, and others will drill a 2,000-foot wildcat test on a block of 1,840 acres in the extreme western part of Callahan County, already having let contract to Grover & Rose of Albany for the drilling. It will be on the Leggett lands, in section 7, Block 8, E.P.R.R. Survey. Other blocks have been taken in that part of the county. O. M. Murry & D. O'Neal spudded a wildcat on the John L. Estes lands, in section 66, Block 14, T.&P. Survey, on a block of 1,890 acres in the northwestern part of the county. Contract calls for a 2,250-foot test. It will be only a couple of miles from the recent discovery of Dunn & McAllister in Taylor County.

WEST TEXAS COMPLETIONS

Andrews County

Fuhrman Petroleum Corp. No. 5-B Bann, 4,239-4,503 feet, shot, 262 bbls., 2½ per cent water.

Crane County

Superior Oil Co. No. 4 Hughes, 2,250-65 feet, acidized, 735 bbls. Gulf Oil Corp. No. 148 McElroy, 2,955-83 feet, shot, 122 bbls. on pump; No. 149 McElroy, 2,930-85 feet, shot, 291 bbls.; No. 4 Tubbs, 4,320-4,440 feet, acidized, 1,232 bbls. in six hours. Sinclair Prairie Oil Co. No. 1-24 University, 3,526-3,615 feet, plugged back to 3,591 feet, 342 bbls.

Ector County

Shasta Oil Co. No. 1 Cummins, 4,180-4,256 feet, acidized, 297 bbls. Landreth Oil Corp. No. 2-E Scharbauer, 4,150-4,229 feet, shot, 264 bbls.; No. 3-D Scharbauer, 4,176-4,231 feet, acidized, 1,300 bbls. Amon G. Carter No. 1 Johnson, 4,067-4,190 feet, shot, 405 bbls. Broderick & Calvert No. 3 Foster, 4,125-4,300 feet, plugged back to 4,196 feet, shot, 541 bbls. Gulf Oil Corp. No. 19 Goldsmith, 4,126-4,216 feet, 2,176 bbls. Stanolind Oil & Gas Co. No. 45 Cowden, 4,050-4,290 feet, shot, 787 bbls. Sun Oil Co. No. 1-C Holt, 4,101-4,310 feet, shot, 631 bbls.

Fisher County

General Crude Oil Co. No. 9 Willingham, 3,114-17 feet, acidized, 240 bbls. on pump.

Howard County

Shell Petroleum Corp. No. 3-A Roberts, 2,993-3,011 feet, 9 bbls. fluid in one hour, 40 per cent water; No. 2-A Settles, 2,455-2,575 feet, acidized, 25 bbls. in six hours on pump, 20 per cent b.s. and water. Lee and Stanolind No. 4 Kloh, 2,385-2,502 feet, acidized, 1,080 bbls. on pump. Ennisbrook Oil Co. No. 14 Texas Land & Mortgage Co., 2,620-2,798 feet, shot, 697 bbls. on swab.

Loving County

Kone Production Co. No. 5 Pecos Valley, 1,628-31 feet, shot, 80 bbls. Braun No. 19 Tippett, 4,077-79 feet, 79 bbls. of oil and 779 bbls. water on pump. Ohio Oil Co. No. 39-B Yates, 1,233-34 feet, 1,242 bbls. per hour. Cardinal Oil Co. No. 4-I Tippett, 573-82 feet, plugged back to 575 feet, 20 bbls. of oil and 65 bbls. water. E. R. Minshall No. 1 Banker, dry and abandoned 3,005 feet, elevation 3,090 feet. Adams & Black No. 1 Masterson, dry and abandoned 1,740 feet, elevation 2,455 feet.

Reagan County

Bahan & Rhodes No. 1 Kloh, dry and abandoned 3,687 feet, elevation 2,680 feet.

Reeves County

Grisham-Hunter, Inc. No. 1 Montgomery, dry and abandoned 4,065 feet, elevation 2,891 feet.

Upton County

Brown and others No. 1 Mayhew, dry and abandoned 4,053 feet, elevation 2,456 feet. Homestead Oil & Gas Co. No. 4-B Prue-Hughes, 2,663-2,745 feet, acidized, 951 bbls. on pump. R. W. Fair No. 3 Cordova Union, 2,235-39 feet, acidized, 378 bbls. oil and 100 bbls. water. Rodman & Easter No. 1 Humble-Hughes, 2,390-2,489 feet, acidized, 714 bbls. on pump. Gulf Oil Corp. No. 4-B Hughes, 2,265-66 feet, acidized, 283 bbls., 2 per cent water. Gulf Oil Corp. No. 26 Crier-McElroy, 2,765-2,965 feet, shot, 812 bbls.; No. 9-E Sherk, 2,318-44 feet, acidized, 692 bbls., 6 per cent water on pump; No. 9 Sherk, 2,361-78 feet, acidized, 506 bbls. on pump. British American Oil Co. No. 6 Robbins, 2,195-2,222 feet, acidized, 1,080 bbls. on pump. Cardinal Oil Co. No. 2-C Shell-Wooley, 2,054-2,147 feet, acidized, 120 bbls. on pump. Stanolind Oil & Gas Co. No. 43 Burleson, 2,100-58 feet, acidized, 268 bbls. oil and 8 bbls. water on pump. Brown and others No. 2-A Baker, 2,345 feet, plugged back to 2,341 feet, 652 bbls. on pump. Ellis No. 5 Robbins, 2,095-2,114 feet, acidized, 630 bbls. on pump.

Winkler County

Illinois Oil Co. No. 15-B Central State Bank of Abilene, 2,760-3,120 feet, shot, 997 bbls.; No. 7-A Central State Bank of Abilene, 2,849-3,110 feet, shot, 2,013 bbls. Siosi Oil Co. No. 10 Lovett, 2,775-3,120 feet, shot, 817 bbls. W. K. Royalty Co. No. 5-B Walton, 3,015-54 feet, 5,294 bbls. Humble Oil & Refining Co. No. 7-B Walton, 2,786-3,100 feet, shot, 195 bbls. Empire Oil & Refining Co. No. 7-D Daugherty, 2,800-3,030 feet, shot, 504 bbls. through seven-eighths inch choke. Amerada Petroleum Corp. No. 3 Daugherty, 2,861-2,961 feet, 724 bbls. Magnolia Petroleum Co. No. 75 Walton, 2,806-2,920 feet, shot, 508 bbls.; No. 77 Walton, 2,720-3,282 feet, shot, 611 bbls.; No. 78 Walton, 2,775-2,928 feet, shot, 530 bbls. Sinclair Prairie Oil Co. No. 4-C Cummins, 2,810-3,035 feet, shot, 262 bbls.

Ward County

Tysco Oil Co. No. 1 Casey, dry and abandoned 2,382 feet. Standard of Texas No. 30 York, 2,400-2,525 feet, shot, 241 bbls. through 1¼-inch choke; No. 6-WY McFarlane, 2,500-2,645 feet, shot, 2,316 bbls. Tide Water Associated No. 21 Johnson, 2,545-2,665 feet, 2,765 bbls.; No. 23 Johnson, 2,532-2,660 feet, shot, 3,542 bbls.; No. 24 Johnson, 2,481-2,615 feet, shot, 1,086 bbls.; No. 25 Johnson, 2,547-2,675 feet, shot, 4,061 bbls. Gulf Oil Corp. No. 76 Hutchins, 2,760 feet, 60 bbls. per hour.

100-Bbl. Well in Eastern Kentucky; Very Active in Western Side of State

By SPECIAL CORRESPONDENTS

OWENSBORO, Ky., May 24.—Eleven wells completed in the Western Kentucky field in the past week included a 200-bbl. initial producer in the Hardin pool, W. E. Hupp and others No. 17 Hackett Brothers, producing from Jett sand.

New work is reported from all eight counties included in the report. Summary for the week follows:

Hancock County

Patesville district: Roy Beard No. 2 Jim Dunn, 5 bbls., Jett sand. Drilling deeper.

Easton district: J. C. Ellis No. 14 Link Richards, J. C. Ellis No. 9 H. D. Fuqua, W. E. Hupp No. 1 Matt Young, W. E. Hupp No. 4 Emma Falls, all drilling.

Floral district: Cumberland Petroleum Co. No. 2 Joe Powers, dry hole, total depth 585 feet.

Pellville district: O. D. Vickers and others No. 3 Mrs. M. O. Brown, drilling 325 feet; No. 3 Mitchell Huff, 15 bbls., Jett sand 539-563 feet; No. 3 I. C. Stevens, spudding in; No. 1 W. D. Richardson, location.

Ohio County

Fordsville district: H. Vickers and others No. 9 W. C. Richards heirs, spudding in. Clark & Snyder No. 1 W. E. Hedden, drilling. Interstate Oil & Gas Co. No. 4 A. Brunnell, small gas well, total depth 589 feet; No. 5 J. G. Withers, dry hole, total depth 398 feet.

Friendship Church district: South Penn Oil Co. No. 8 F. L. Royal, drilling. Fred J. Young and others No. 10 Oscar Whitehouse, drilling 250 feet. Cane Run Petroleum Co. No. 17 C. J. Rhoades, 50 bbls. Inland Oil & Gas Co. No. 4 A. S. Crawley, drilling 500 feet.

Ralph district: A. Ford and others No. 1 R. P. Ralph, drilling 650 feet.

Adaburg district: Shaffer and others No. 3 Joe Helm, dry hole, total depth 1,010 feet. Bates and others No. 2 Basil Taylor, drilling at 200 feet. Sherman Hall No. 1 W. Whittaker, drilling at 300 feet. Rex-Pyramid Oil Co. No. 13 Len Stinnett, spudding in. Western Kentucky Petroleum Co. No. 37 Mary Elmore, 358 feet in Jett sand, 8 bbls. Chester Oil Co. No. 2 E. M. Howard, dry hole, 802 feet.

Dundee district: Globe Oil Co. No. 18 Rommey Graham, 50 bbls., Jackson sand. Jay Petroleum Co. No. 2 O. N. Stewart, rigging up. Doc Serman No. 4 J. B. Mitchell, drilling 550 feet. Evans and others No. 7 Cameron heirs, drilling 150 feet.

Taffy district: Joe Brunner and others No. 3 W. C. Hoover, dry hole, 740 feet. George Hogue and others No. 2 Anna W. Hoover, drilling.

Heflin district: Thomas Galey and others No. 5 J. W. Smith heirs, dry hole, 675 feet. Carpenter and others No. 1 Oscar James, drilling Jones sand at 1,228 feet, hole full of water.

McLean and Ohio Counties

Hardin pool: Carpenter and others No. 1 William Hardin heirs, 112 acres, drilling 160 feet. W. E. Hupp and others No. 1 L. W. Tichenor, 40 bbls. Jett sand 1,137-1,147 feet, drilling deeper. W. E. Hupp and others No. 17 Hackett Brothers, 200 bbls. Jett sand. W. E. Hupp No. 18, 19 and 20 Hackett Brothers, drilling. Petroleum Co. No. 4 Mrs. Bettie Cullen, drilling 970 feet; No. 5 and 6 Mrs. Bettie Cullen, drilling. J. C. Miller and others No. 3 Austin & Cullen, drilling in Jett sand; No. 4 Austin & Cullen, drilling in brown lime; No. 5 Austin & Cullen, drilling 200 feet. W. E. Hupp and others No. 1 John A. Givens, drilling 720 feet. Clark & Snyder No. 2 Barnett heirs, spudding in. Culbreath and others No. 1 T. E. Howell, drilling 1,440 feet.

Daviess County

Pellville district: O. D. Vickers and others No. 4 Eli Carder, drilling 410 feet. Rex-Pyramid Oil Co. No. 1 John Cooper, moving in. Ohio Oil Co. No. 6 G. A. Weller, moving in.

Cane Run School district: Kentucky Producing Corp. No. 3 E. L. Omstott, drilling 750 feet. Rex-Pyramid Oil Co. No. 8 S. Hinton north tract, drilling 400 feet.

Hewlett's Store district: Sunflower Oil & Gas Co. No. 1 Ollie Bean, rigging up.

Red Hill district: H. C. Davis and others No. 6 Herbert Salmon, drilling 500 feet. Hoosier Drilling Co. No. 1 Jim Yeiser, spudding in. Globe Oil Co. No. 3 W. R. Russell, moving in.

McLean County

Knobs district: Cumberland Petroleum Co. No. 7 Elmer Nail, 25 bbls., Barlow sand 1,554-1,563 feet, total depth 1,643 feet, plugged back to 1,563 feet. A. D. Noe and others No. 1 Eaves Barrett, underreaming to 1,875 feet.

Island district: Snowden & McSweeney No. 1 J. P. Daniels, spudding in.

Hopkins County

Slaughters district: Imperial Oil & Gas Co. No. 1 Archibald Estate, top brown lime 2,270 feet.

Webster County

Onton district: W. Sargent and others No. 1 J. E. Jenkins, spudding in.

Breckenridge County

Falls of Rough district: A. V. Smith and others No. 1 T. P. Fugua, drilling.

EASTERN KENTUCKY

ASHLAND, Ky., May 24.—Twelve completions were reported in Eastern Kentucky last week with the flow of oil in the various wells ranging from 2 to 100 bbls. a day. One pressure well was reported with an operator in Estill County putting in two strings of tubing in an old well to make a flow of 20 bbls. of oil per day.

The Petroleum Exploration Co. has reopened the repressuring station on the Horn farm near Campbell

(Continued on Page 210)

WORLD'S DEEPEST OIL WELL SUCCESSFULLY RECOMPLETED

By F. L. SINGLETON

HOUSTON, Tex., May 24.—The recompletion of Humble Oil & Refining Co. No. 1 Ellender on the north flank of the Houma gas field in Terrebonne Parish, Louisiana, for the world's deepest producer, and the opening of the first oil production in the Big Lake field in Cameron Parish, Louisiana, were the outstanding developments along the Gulf Coast the past week. Other interesting features in the Louisiana Coast included the blowout of a 12,000-foot wildcat in St. Mary Parish and the completion of a mile west extension to the old Vinton field in Calcasieu Parish, Louisiana.

Humble Oil & Refining Co. No. 1 Ellender, Terrebonne Parish, which was killed last week after it began to show salt water when tested through perforated casing at 11,620-30 feet, was recompleted for a large oil producer and is flowing at the rate of 37 bbls. per hour through a quarter-inch choke with tubing pressure 2,750 pounds, and casing pressure 3,100 pounds. The gravity of the oil tested 36 degrees, with a gas-oil ratio of 400 to 1. The well has about cleaned itself, as it is showing only 8 per cent wash water with no evidence of salt water.

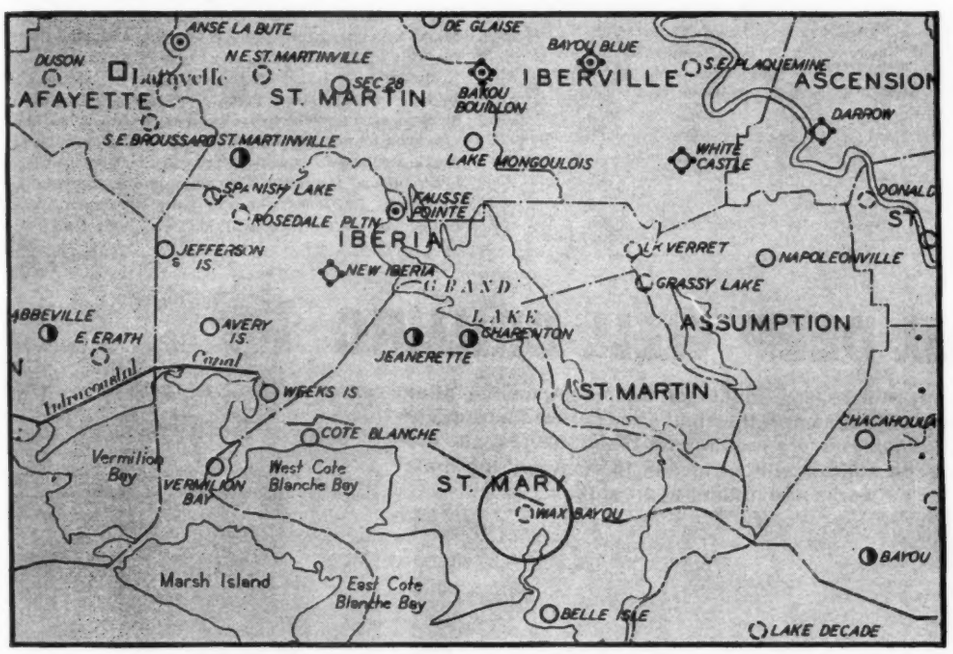
No. 1 Ellender was recompleted by plugging back to 11,609 feet and perforating the casing with nine holes at 11,610-15 feet. This field is located about 18 miles southeast of the town of Houma, centering in section 23-19s-19e, about 4,000 feet east of Bayou Terrebonne.

Big Lake an Oil Field

The Big Lake field, central Cameron Parish, opened in December, 1935, as a distillate field by the completion of Magnolia Petroleum Co. No. 1 Broussard, was converted into an oil field by Union Sulphur Co. No. 1 J. O. Hebert, approximately a half mile east of the discovery well. Sand showing oil was topped at approximately 8,312 feet, and after the hole had been cored to a depth of 8,336 feet, 7-inch casing was cemented on bottom. Perforations were made with 20 holes at 8,324-29 feet, and on a 24-hour gauge ending 7 A.M. May 20, it flowed 560 bbls. of 38-gravity oil through a quarter-inch choke with tubing pressure 1,510 pounds. It is estimated to be making about 800,000 feet of gas daily.

No. 1 Hebert is producing from sand about 300 feet lower than the discovery well, completed through perforations at 7,900-66 feet. It is the fourth well drilled and the first by Union Sulphur Co. who took over operating control of the large block from Magnolia Petroleum Co. the first of the year. The latter company had drilled holes north, south and southwest of the discovery well. The completion of No. 1 Hebert brings to light the increasing number of new oil fields originally discovered as high-pressure gas wells and then converted into oil fields by additional development.

In this respect two important locations have been announced for the South Roanoke field in Jefferson Davis Parish and the Abbeville field in Vermilion Parish, both of which were discovered this year by the completion of distillate wells. At South Roanoke, Jefferson Davis Parish, Shell Petroleum Corp. has farmed out a portion of acreage to the Union Sulphur Co. which is moving in material for No. 1 Sthoke, about a mile northwest of the discovery well in section 23-10s-4w. The discovery well flowed distillate through perforations below 8,500 feet. One-half mile east of the Abbeville field, Vermilion Parish, Continental Oil Co. has made location for No. 1 Brookshire in section 66-12s-3e. This test will probably be drilled below 12,000 feet due to the encouraging showings encountered in the company's No. 1 O. C. Hebert the discovery well which was drilled to a depth of 12,216 feet, where it showed tremendous pressure and some oil. The operators were unable to make a thorough test of this section, due to mechanical trouble and the hole was plugged back and the well completed for a distillate well through perforations at 7,666-75 feet.



Evidence of another deep producing field for the Louisiana Coast was indicated by Texas Co. No. 1 Bayou Sale, Wax Lake Prospect, St. Mary Parish, indicated by large circle, which blew out and burned while fishing for stuck drill stem at 12,261 feet

Serious Trouble at Deep Well

Texas Co. No. 1 Bayou Sale, located on the Wax Lake Prospect, southern St. Mary Parish, which was the most active deepest test in the world, having reached a depth of 12,261 feet, encountered its first serious trouble and will probably be abandoned as the rig and derrick were destroyed by fire after the well blew out. The blowout occurred while the hole was being washed with fresh water in an attempt to loosen 1,596 feet of stuck drill stem bottomed in hard sandy shale at the total depth. The fire lasted for one hour at which time it was extinguished when the hole bridged over. The hole was scheduled to be drilled to a maximum depth of 15,000 feet and several sands above 12,000 feet had been indicated on a Schlumberger survey. The blowout definitely proves the structure, and a new location will no doubt be announced should the present test be abandoned. The last string of protection string was cemented at 10,975 feet and the hole may be in such a condition that it will not be necessary to abandon.

Vinton Field Extended

Woodley Petroleum Co. extended the old Vinton field, Calcasieu Parish, 1 mile west by the completion of No. 1 Gray which flowed 12 bbls. of 32-gravity oil per hour through a quarter-inch choke with tubing pressure 1,300 pounds and casing pressure 550 pounds. Production is from a screen setting made at 3,600 feet to 3,734 feet, the total depth. The well is located in the south corner of section 32-10s-12w, and is expected to result in considerable drilling activity.

Louisiana Crusader Oil Co. No. 1 Langley, an interesting wildcat on the Pine Island Prospect, Jefferson Davis Parish, is coring in sandy shale below 7,625 feet after encountering several sands above that depth. Sand showing oil was topped at 7,359 feet and on an eight-minute drill stem test with the seat at 7,325 feet, it showed 22 stands of water cushion and 22 stands of fresh water with no show of oil or gas. While making the test, the tool slipped to 7,355 feet before opening and this test may be discounted. Soft sand showing gas was encountered at 7,500 feet and sand and sandy shale with a slight oil odor from 7,497-7,500 feet. Location is in section 36-7s-5w.

On the Marchland Salt dome, William Helis is preparing to test No. 1 City of New Orleans located in section 19-23s-23e. After using the hole for geophysical work, the hole has been plugged back from 7,607 feet and the 7-inch casing cemented at 7,607 feet is being perforated at 7,303-33 feet which is over 100 feet above the top of the salt encountered at 7,463 feet. Fohs Oil Co. No. 1 State Lake in section 65-17s-19e is drilling in shale below 8,610 feet and is being watched with interest.

New Wells in Jeanerette

Two completions were recorded in the Jeanerette field by the Herton Oil Co. No. 8 Banta flowed 869 bbls. per day through a quarter-inch choke with tubing pressure 1,020 pounds from a screen setting made at 6,637-50 feet, the total depth and No. 6 Carter flowed 769 bbls. per day through a quarter-inch choke with tubing pressure 1,040 pounds. Oil sand was cored at 7,031-41 feet and the well was completed with 7-inch casing cemented at 7,006 feet.

Pan American Production Co. No. 4 Harang, section 17, Valentine field, Lafourche Parish, was plugged back to 5,445 feet and it was completed for an initial production of 26 bbls. per hour through a three-sixteenths inch choke with tubing and casing pressure equalized

at 800 pounds. Production is from perforations at 5,407-32 feet.

In the Charenton field, Pan American Production Co. No. 1 South Coast Corp., which found a deeper sand, was plugged back to 7,915 feet and is flowing an estimated 600 bbls. of fluid per day of which 50 per cent is salt water. It will probably be recemented and another test made.

Additional activity in the old Jennings field, Acadia Parish, has been assured by W. T. Burton No. 1 J. J. Roboria and others. The hole is bottomed at 6,904 feet and casing is being run to test three oil sands encountered from 6,513-57 feet, 6,756-77 feet and 6,791-6,801 feet. All sands were cored and confirmed by a Schlumberger survey. The well will extend production south of Superior Oil Co. No. 1 Iowa Jennings, the most southerly producer on the southwest flank.

Texas Coastal Fields

With the testing of salt water in a deep test southwest of the Buckeye field, Matagorda County, developments along the Texas coast were quiet.

United North and South Development Co. No. 1 Stoddard, 1½ miles southwest of the Buckeye field, Matagorda County, perforated casing at 9,769½-81 feet and swabbed 500 feet of brackish water. The perforations have been cemented off. Another test is scheduled to be made below 9,800 feet and if this fails the hole is scheduled to be carried deeper. Location is in the J. S. Cotton Survey.

One mile southeast of production of the Segno field, Polk County, Humble Oil & Refining Co. was preparing to make a drill stem test at No. 3-B Kirby Lumber Co. located in the Marcell Victor Survey. Sand was topped at 5,340 feet and cored to a total depth of 5,342 feet, at which depth an electrical coring test was made. The well is bottomed approximately 200 feet lower than the producing wells in the field, having topped the Cockfield at 5,240 feet which makes the test rather doubtful. In the field proper, J. K. Dorrance No. 1 Wing is being tested after cementing a full string of 5-inch casing at 5,177 feet. Bottom of the hole is 5,195 feet. LaQuinta Oil Co. No. 2 Wing in I.&G.N. Survey No. 15, cored oil sand at 5,176-78 feet and sandy shale showing oil at 5,178-94 feet, the total depth. Seven-inch casing is being cemented. Rajo Oil Corp. No. 1 Wing, topped oil and gas sand at 5,180 feet and the well is flowing into the pit from a screen setting at 5,182-98 feet, the total depth.

In the Katy Area

In the Katy area, southeastern Waller County, Stanolind Oil & Gas Co. was running 7-inch casing to 7,500 feet after running an electrical coring test. Based on geological markers, the well is running about normal with the discovery well to the northwest and has encountered gas sands. The Cockfield was topped at 6,183-6,212 feet, Discorbis at 6,311 feet and the Eponides at 6,473 feet. Location is three-quarters of a mile southeast of the discovery well in the T. S. Reese Survey.

Preparations are being made by Stanolind Oil & Gas Co. to test No. 1 D. A. Oatest, 4,150 feet south of the discovery well of the Clinton field. The hole has been cleaned of the 3-inch drill stem and screen and line is being run to test at a plugged back depth of 8,095 feet. To the northwest, at the Fairbanks field, Amerada Petroleum Corp. and Stanolind Oil & Gas Co. No. 1 W. Jacobs was plugged back to 6,835 feet and flowed 20 bbls. per hour through a quarter-inch choke, but the well started showing salt water and it has been killed to recement. Perforations were made at 6,824-28 feet.

Drilled Into Salt Water

Offsetting the discovery well of the Sandy Point field, Brazoria County, Bunte Oil & Gas Co. and others No. 1 Fite is bottomed in salt water sand at 6,568 feet and 7-inch casing is being cemented to test a sand which showed gas and distillate at 6,457-74 feet. The discovery well was completed for a small oil well through perforations at 6,489-6,501 feet. One mile southeast of the discovery well, the same company's No. 1 A. A. Sharp is drilling in shale and sand below 5,200 feet.

One mile southwest of production of the Lockridge field, Brazoria County, Gulf Oil Corp. No. 1-A Wood flowed mud, oil and salt water when tested through perforated casing and has been plugged back to 6,350 feet where another test is to be made. The well has shown considerable oil and gas on drill stem test, and is assured of making an extension to the field, although it practically defines production as it is close to the water level. East of production Shell Petroleum Corp. No. 3 Ramsey is coring sand at 6,776 feet with no additional showings encountered.

On the southwest edge of the Silsbee field, Hardin County, Republic Production Co. and Houston Oil Co. are running 7-inch casing to a total depth of 6,965 feet after showing pipe line oil on a drill stem test in the Lower Cockfield at 6,954-65 feet. Across the line in Tyler County, surface casing has been cemented on the company's No. 3 Hurd at 2,331 feet. This is the first well to be started since the Spurger field was opened two weeks ago.

Offsetting the discovery well of the Ganado field, Jackson County, Texas Co. No. 1 Hultquist is coring sand showing oil and gas below 5,100 feet. The discovery well was completed in the top section at 5,111 feet and the second test is expected to be completed several feet deeper in order to lower the gas-oil ratio as experienced in the discovery well.

New York-Pennsylvania Gas

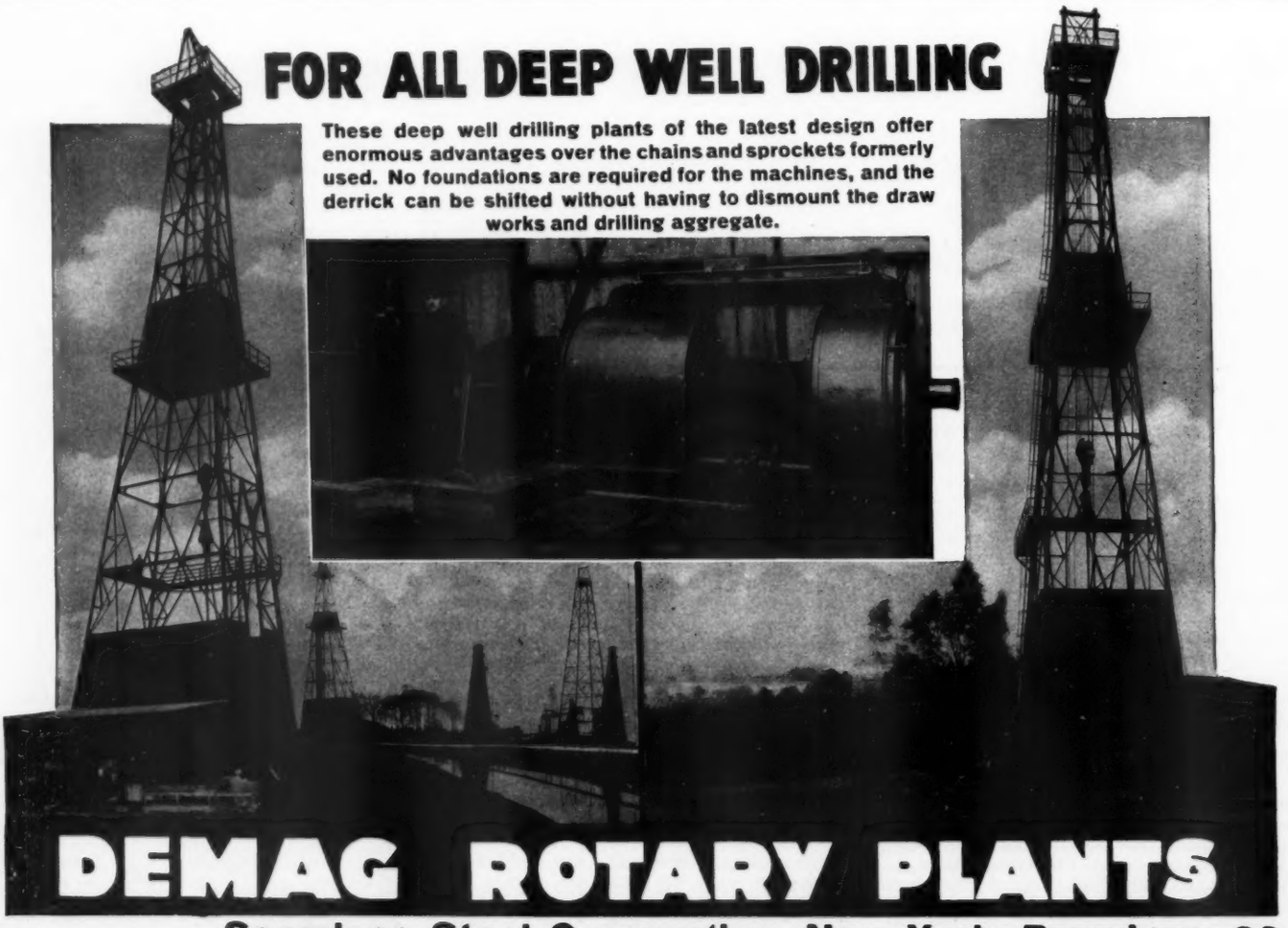
(Continued from Page 188)

Township, Warren County, Pennsylvania, and are drilling at 1,485 feet. Updegraff is spudding on the C. E. Erickson farm, Elk Township, same county.

New York Operations

Kaufman and others are down 4,475 feet on the Bank Angelica farm, Allen Township, Allegany County. This test found the Niagara lime at 4,413 feet.

Sylvania Corp. is running casing in its test on the William Hendrickson farm, Troupsburg Township, Steuben County, which has been drilled to 5,096 feet. This well topped the lime at 5,075 feet. Belmont Quadrangle Drilling Corp. is drilling at 310 feet on the Clara Lynch farm, Hartville Township, and is moving in equipment for a test on the Clara Botteinger farm, Jasper Township.


FOR ALL DEEP WELL DRILLING
These deep well drilling plants of the latest design offer enormous advantages over the chains and sprockets formerly used. No foundations are required for the machines, and the derrick can be shifted without having to dismount the draw works and drilling aggregate.
DEMAG ROTARY PLANTS
Agents for U. S. A.: Seamless Steel Corporation, New York, Broadway 39

36 NEW EAST TEXAS WELLS; TALCO HAS 13 COMPLETIONS

By L. E. BREDBERG

DALLAS, Tex., May 24.—Thirty-six new oil wells were completed in the East Texas field and 13 new producing wells were brought in in the Talco field in the past week. The Opelika well in Henderson County is not yet a completion, because of a stuck drill pipe which had to be cemented in the hole. The Magnolia Petroleum Co. caused a stir on Saturday when it raised its posted price for East Texas crude 8 cents per barrel to offset the premiums which for months have been paid in that field by independent buyers. The Magnolia's new price is $1.35 per barrel.

Three miles north of Troup and west of the southern end of the East Texas field, wildcat location has been staked for a test by T. W. Doswell and others and material moved in on the J. Allred lands in the B. Lafferty Survey, in Smith County.

Another wildcat is to be drilled by T. E. Rossiter on the J. P. Fulton farm, in survey of the same name, 4½ miles east of Doney in Freestone County. Two other tests in that county are now shut down. E. B. Collard and others are rigging up a wildcat on the P. Niekamp lands, in the W. Hampton Survey, 3 miles east of Lott in Falls County. It will probably be an Edwards lime test, the other wildcat drilling in the county by H. H. Bell and others on the A. Garrett lands, in the J. M. Sanches Survey, having filled 700 feet with oil in 15 hours at a total depth of 1,244 feet. It is also to be deepened to the Edward lime in quest of higher production.

Deep Disappointment

The Trinity test of T. L. Hunter and the American Liberty Oil Co. on the Blackfoot structure in Anderson County, located on the G. E. Gauge farm, in the B. Gilbert Survey, which topped the Paluxy at 6,758 feet and Glen Rose at 7,029 feet, has been abandoned at a total depth of 9,205 feet after making a drill stem test that showed salt water with no gas or oil.

Probable Trinity Test

The northeast corner of the northern extension of the Cayuga field, in Henderson County, may be given a Trinity sand test if location of the Sun Oil Co. on the Royall Watkins farm in the John Hollien Survey, proves a failure in the Woodbine. A sufficiently large hole is to be carried down to insure setting big pipe in order to allow deep drilling if necessary. If carried down it will be an important test for Cayuga in which there are now two gas-distillate wells with another Trinity test drilling, by Roeser-Pendleton, Inc., of Fort Worth.

Walter Bradley is scheduled to sink a 6,500-foot test on a 7,112-acre Bivens block southeast of Longview and several miles east of the East Texas field in quest of production in the Trinity. Operations are scheduled to start by July 1 according to lease contracts.

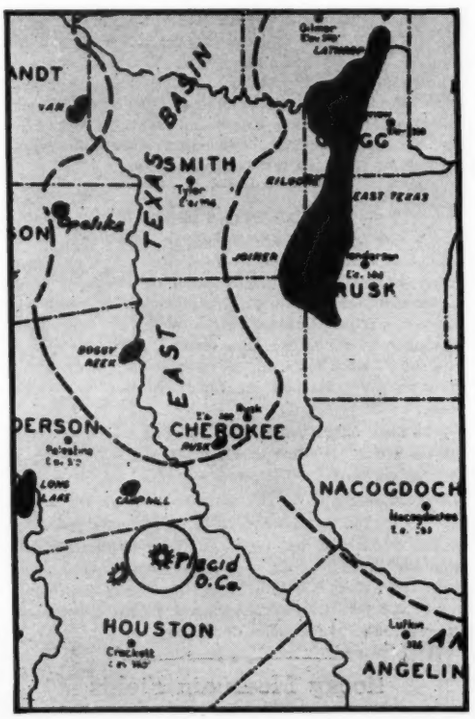
The Barnett Petroleum Corp. of Dallas has taken over the 2,000-acre John G. Mayo block and test on the J. C. Sanford farm in the William A. Corder Survey, 10 miles east of Mount Enterprise and on what is known as the Mount Enterprise faulted structure in southern Rusk County. It is preparing to spud. This will be the second deep test to be drilled on this structure, the Pure Oil Co. having abandoned such a test last year at a total depth of 7,999 feet. It was located on lands of W. H. Faulkner in the William Elliott Survey.

Leases on this structure were first taken in 1928 by the Pure Oil Co., the structure having been considered as one of the most likely looking areas in the district. This second location was made following geophysical survey using the reflection seismograph method, which showed definite closure on the south upthrow side of the fault. The Magnolia Petroleum Co., Pure Oil Co. and United Gas Public Service Co. hold acreage around the new wildcat test.

Stanolind Oil & Gas Co. No. 1 Hawks, in the R. Ragsdale Survey, near Campbell, in the northeastern part of Hunt County, and along the Mexia-Talco fault plane, found the Paluxy sand barren when passed through last week but logged the Glen Rose lime at 4,815 feet and is drilling ahead in it below 4,927 feet.

Seven miles west of Mount Selman, in Cherokee County, H. A. Stotle has assembled 4,000 acres in a block.

A new test for Smith County is that of J. N. Buchanan of Omaha, who has staked location in the C. D. Weather-



The most recent strike in East Texas—Placid Oil Co.'s gas-distillate well near Grapeland in northeastern Houston County, on the south end of the Woodbine Basin

ford Survey in the southeastern part of the county for a Woodbine sand well.

More wildcats are being started in the Eastern Texas district and although a number of Trinity tests have proved failures in various parts of the district within the past year, one strike would offset many failures and arouse new interest. The Opelika discovery, although not yet completed as a commercial producer on account of a stuck drill pipe which had to be cemented in the hole, has caused operators to resume leasing activities, especially in Henderson County, in which the discovery was made.

EAST CENTRAL TEXAS COMPLETIONS

Anderson County

Hunt Oil Co. No. 1 A. Cartmel, 5,344 feet, 132 bbls. in 24 hours through one-eighth inch choke. C. L. Mahaney No. 1 W. S. Price, 5,349 feet, 70 bbls. in 24 hours through one-eighth inch choke. Tide Water and others No. 7-B Wills, 4,089 feet, 25 bbls. in 24 hours through five-fourteenths inch choke.

Franklin County

Hinton and others No. 2 Owings, 4,351 feet, 230 bbls. in 24 hours on pump. W. F. Nenny and others No. 1 Birdwell Schoot Lot, 4,335 feet, 100 bbls. in eight hours on pump.

Angelina County

Plaza Oil Co. No. 3 Martin Wagon Works, 1,461 feet, 1 bbl. per day, lots of water.

Hunt County

Placic Oil Co. No. 1 Elliott, 6,634 feet, 6 miles NE Grapeland, 1 bbl. oil per hour through one-quarter inch choke, 12 bbls. fluid per hour, 640,000 feet gas, casing pressure 1,550 pounds, gravity of oil 48.1 degrees.

Titus County

Adams and Lyle No. 2 Pat Davis, 4,319 feet, 425 bbls. on pump; No. 6 Pat Davis, 4,340 feet, 477 bbls. on pump. B. G. Byars and others No. 1-B Edwards, 4,300 feet, 285 bbls. on pump. Byrd-Frost, Inc., No. 2 C. M. Carr, 4,278 feet, plugged back to 4,155 feet, 16 bbls. per hour, 33 per cent water, on pump. Hinton and others No. 3 Coker, 4,245 feet, 606 bbls. on pump. Humble Oil & Refining Co. No. 38 King, 4,314 feet, 304 bbls. on pump; No. 8 Monning, 4,305 feet, 49 bbls. on pump; No. 3 Pan American Life Insurance Co., 4,301 feet, 310 bbls. on pump. Magnolia Petroleum Co. No. 7 Mainard, 4,288 feet, 350 bbls. on pump. Dr. J. S. Rushing No. 6 Mitchner, 4,258 feet, 412 bbls. on pump. Tide Water Associated No. 7 Carr, 4,315 feet, 120 bbls., flowing.

EAST TEXAS COMPLETIONS

Gregg County

Arkansas Fuel Oil Co. No. 44 Burnside, 3,489-3,514 feet, 32 bbls. in 15 minutes. Atlantic Refining Co. No. 8 Sheffield, 3,619-50 feet, 50 bbls. per hour. Fain-McGaha, Inc., No. 16-A Tooke, 3,569-3,609 feet, 20 bbls. in 15 minutes. W. R. Jones No. 4 Satterwhite, 3,702-11 feet, 30 bbls. in 30 minutes. Shell Petroleum Corp. No. 10 Jones, 3,525-85 feet, 17 bbls. in 13 minutes. Stanolind Oil & Gas Co. No. 26-B Lathrop, 3,586-3,620 feet, 26 bbls. per hour. Amerada Petroleum Corp. No. 6 Jenkins, 3,505-21 feet, 15 bbls. in 40 minutes. Empire Oil & Refining Co. No. 11 Walker, 3,662-76 feet, 9 bbls. in 15 minutes. Gulf Oil Corp. No. 95 Hilburn, 3,504-24 feet, 20 bbls. in 75 minutes. Alex McCutchin No. 5 Elder, 3,546-3,610 feet, 75 bbls. day on pump. Magnolia Petroleum Co. No. 35 Radford, 3,648-49 feet, 46 bbls. per hour.

Rusk County

Abercrombie & Harrison No. 17 Cantrell, 3,630-71 feet, 93 bbls. per hour. Atlantic Refining Co. No. 22 Brightwell, 3,618-95 feet, 57 bbls. per hour. Humble Oil & Refining Co. No. 17 Peterson, 3,550-3,615 feet, 18 bbls. per hour on gas lift. Magnolia Petroleum Co. No. 18 Moore, 3,648-76 feet, 20 bbls. in 15 minutes. Shell Petroleum Corp. No. 14 Spivey, 3,643-3,714 feet, 35 bbls in 30 minutes. Aston & Greenway No. 12 Alford, 3,664-3,718 feet, 20 bbls. in 15 minutes. Fair & Thompson No. 2 Alford, 3,573-95 feet, 60 bbls. in two hours. Gant and others No. 7 Edwards, 3,584-3,600 feet, 33 bbls. per hour. Gulf Oil Corp. No. 13 Murphy, 3,758-68 feet, 40 bbls. per hour. Humble Oil & Refining Co. No. 10 Dennis, 3,700-51 feet, 70 bbls. per hour; No. 11 Dennis, 3,720-59 feet, 75 bbls. per hour. T. A. Johnston Tr. No. 2 Stewart, 3,729 feet, 21 bbls. in 50 minutes. Pine Petroleum No. 8 Giles, 3,683-3,727 feet, 70 bbls. per hour.

Upshur County

J. W. Wadley No. 1 Whitcher, 3,743-50 feet, 10 bbls. per hour on pump, 50 per cent water. Mudge Oil Co. No. 16-A Free, 3,614-90 feet, 120 bbls. per

hour. P. H. Pewitt No. 9 Williford, 3,688-89 feet, 30 bbls. per hour. B. F. Phillips No. 1 Everts, 3,637-38 feet, 65 bbls. per hour; No. 2 Duphrates, 3,748-53 feet, 30 bbls. per hour. Rogers and others No. 5 Evers, 3,838-43 feet, 20 bbls. in five hours on pump. Rudco Oil & Gas Co. No. 2 Nicholson, 3,696-97 feet, 20 bbls. per hour. Stanolind and others No. 27-C Flewellen, 3,763-75 feet, 26 bbls. per hour. Gosiwisch & Hanch No. 1 Hamilton, 3,711-17 feet, 100 bbls. in seven hours on pump.

Smith County

McMurray Oil Co. No. 22 Turner, 3,795-97 feet, 40 bbls. per hour. Sinclair Prairie Oil Co. No. 15 Patterson, 3,684-85 feet, 23 bbls. in 20 minutes. Sun Oil Co. No. 1 Henderson, 3,725-26 feet, 20 bbls. per hour.

Louisiana-Arkansas Fields

(Continued from Page 187)

21-4e, Monroe gas field, Morehouse Parish, gauged 2,000,000 feet, 710 pounds rock pressure, total depth 2,227 feet. W. L. Wood No. 1-B Frost Lumber Co., SE section 9-21-3e, gauged 2,000,000 feet at 875 pounds rock pressure, total depth 2,192 feet.

Natchitoches Parish

C. D. Morrison abandoned his location No. 1 Moffett, NE section 20-10-10.

Webster Parish

The W. H. Bass Drilling Co. has failed to pick up the anhydrite in its No. 1 T. Crichton, Jr., located in section 21-20-9 on an extensive block in Webster Parish. The well will be carried to its contract depth of 6,500 feet, where it will be abandoned if structural improvement is not noted. Drilling depth is now 6,350 feet.

Cotton Valley Field—Webster Parish

The Louisiana Department of Conservation has announced that it will not invoke the 160-acre spacing rule at this time in the Cotton Valley field. Instead, the commission will hold a public hearing at some central point in northern Louisiana and give all royalty and landowners a chance to be heard on the matter. It was the claim of the operators that any smaller spacing than one well to 160 acres for the 8,300-foot wells at Cotton Valley would be unprofitable.

ARKANSAS

Miller County

Both wells drilled as offsets to the No. 7 Lenz discovery well east of Texarkana by E. H. Moore, Inc., of Tulsa, after purchasing the Lenz block, have proved dry in the discovery horizon. E. H. Moore No. 2 Dale, 660 feet west of Lenz No. 7, missed the sand entirely and has been abandoned at 4,270 feet. No. 1 Dale, 660 feet east of Lenz No. 7, also missed the sand, but is coring ahead below 4,550 feet as a deeper test of the area.

Nevada County

Benedum & Trees, Inc., No. 1 Grove, old well drilled deeper in the heart of the shallow Troy field, made drill stem test from 4,277-4,317 feet in the Lower Glen Rose, and tested 2,000 feet of salt water only. At a depth of 4,317 feet the well is standing for orders.

Union County

All Arkansas oil men are closely watching what promises to be the second completion in the recently discovered Schulèr field eight miles southwest of El Dorado. Marine Oil Co. No. 1 Marcus Justiss, NW section 18-18-17, topped the saturated sand at 5,593 feet and cored to present total depth of 5,610 feet. Only the bottom 3 or 4 feet were reported as being tight, the remainder representing porous and highly saturated sand such as logged in the discovery well. However, Lion Oil Refining Co. took only 3 feet of penetration in its discovery well, No. 1 Morgan, same section. Casing will be set soon in the Justiss well, and production test is promised early next week.

Sevier County

C. J. Benkley No. 1 Dierks Lumber Co., NW NE SE section 14-10-29w, proposed deep test of this area, has been abandoned at 110 feet without carrying out original plans.

EAST TEXAS (Border Counties)

Panola County

Magnolia Petroleum Co. has cemented 9⅝-inch casing on bottom at 5,948 feet in its No. 2 Hull, T. Applewhite Survey, 3,400 feet southeast of No. 1 Hull, discovery gas producer from the Lower Glen Rose. Casing was set preparatory to drilling No. 2 Hull to the Lower Marine if deeper drilling in the Glen Rose, Pettit or Travis Peak fail to yield commercial oil.

Shelby County

H. A. Stebbinger and others No. 2 Pickering Lumber Co., A. Hanson Survey of Panola County, south of their recent gas-distillate discovery well in the Lower Glen Rose, has been plugged back from 5,125 feet after finding that zone barren. It is now the plan to drill out cement to the bottom of casing at about 5,073 feet and perforate opposite the gas-distillate zone proven by No. 1 Pickering Lumber Co.

MISSISSIPPI

J. P. Wemple No. 1 Southern Forest Land Co., section 29-4n-2e, Amite County, has been unsuccessful in recovering fish at total depth of 5,224 feet. The hole has been cemented back to 2,400 feet, and it is the plan to sidetrack junk and drill ahead in new hole.

In George County, Cleve & Love and others No. 1 J. J. Newman Lumber Co., section 9-1s-8w, is now rigging up for a deep test of that area.

ALABAMA

Joe Modisett and others No. 1 McCorvey, section 20-9n-2w, Choctaw County, is shut down at 161 feet waiting completion of title work. The following companies have taken spreads surrounding this well: Phillips Petroleum Co., 2,000 acres; Southern Natural Gas, 1,000 acres; Magnolia Petroleum Co., 1,000 acres; Superior, 500 acres; Texas, 400 acres; United Gas, 1,000 acres. An 8,000-foot test is proposed here.

Eastern Fields

(Continued from Page 178)

well on the J. E. and M. D. Good farm south of Sissonville. In this district, the Brawley Reid Gas Co. made a location on the L. E. Campbell farm, 1,600 feet southeast of the United Carbon's test on the other L. E. Campbell tract. In the same district, 1,200 feet east of the W. P. Moss gas well, the United Carbon Co. has a location for a test on the Curtis Harper and others lease.

In Poca district, the West Virginia Gas Corp. completed a well on the Victoria L. Burdette farm in the Oriskany sand, total depth 4,871 feet, and it gauges 7,080,000 feet a day. The test of the Hays Oil & Gas Co. on the E. C. Humphreys farm, reported good for 18,000 feet a day, has been tested for more than that amount. A short well record follows: Maxton sand, 1,292-1,380 feet; Big lime, 1,413-1,564 feet; Big Injun, 1,564-1,624 feet; Corniferous lime, 4,682-4,796 feet; Oriskany, 4,796-4,804 feet, shut down.

Rocky Mountain Fields

(Continued from Page 192)

K. D. Pardee No. 1 Corrigeaux, NE NE SE sec. 35-34n-6w. R.U.
Hanah-Porter No. 3 All.-130, NW SE SW sec. 6-32n-5w. Cmtd. 10¾-in. at 571 ft.; W.O.C.
A. R. Pardue No. 1 Anderson, C SE SW sec. 31-32n-5w. Rng. 10¾-in. at 700 ft.
A. E. Crumley No. 2 All.-112, C NW SW sec. 6-32n-5w. Drlg. 1,100 ft.; Colo. 585 ft.; 10¾-in. 612 ft.
Glacier Prod. Co. No. 2 O'Brien, C NW SW sec. 32-34n-5w. Drlg. 940 ft.; Colo. 390 ft.; 10¾-in. 425 ft.
Texas Co. No. 3 Unit 9, C SE SW sec. 9-32n-5w. Drlg. 2,110 ft.
Nadeau Bros. No. 4 Farmers State Bank, CSL NE sec. 17-33n-5w. Drlg. 985 ft.; Colo. 560 ft.; 10¾-in. 590 ft.
Santa Rita O. & G. Co. No. 1 Rasmussen, C NE SW sec. 32-33n-5w. Drlg. 2,830 ft.
Annand-Hutchings No. 3 Federal Land Bank, NE SE SW sec. 11-34n-6w. Drlg. 2,100 ft.
R. E. Lee No. 1 Davis, C S½ SE sec. 15-32n-6w. Drlg. 2,100 ft.
Cut Bank Oil Trust No. 1 Yunck, SE SE SE sec. 23-34n-6w. Drlg. 2,270 ft.

Judith Basin County

Fletcher E. Hunt No. 3, NW SE NE sec. 30-14n-15e. S.D. 1,400 ft.; Kootenai dry; will go to Madison.

Musselshell County

R. C. Tarrant and J. C. Johnson No. 24-A Govt., SW NW NW sec. 25-11n-24e. T.D. 465 ft.; R.U. to resume (formerly Geo. Gregory et al).

Park County

Ben W. Ryan et al No. 1 Burgess, SE SW NW sec. 28-2s-11e. T.D. 606 ft.; prep. to resume.

Pondera County

The Kirk Oil Co. No. 1 Kellogg, SE NW NE section 31-28n-4w, in the Pendroy district, which was shut down for the winter at 2,130 feet, reached the contact at 2,276-86 feet, where it had a show of oil. It was shot without improving conditions and will be abandoned.

Gordon Campbell No. 1 Hughes, NW NE NW sec. 12-30n-4w. Resumed at 2,505 ft.
Clinch Pet., Ltd., No. 1 Hollam, NW NW NW sec. 12-28n-6w. T.D. 2,200 ft.; resumed.

Phillips County

City of Malta No. 1 Govt., C SE SE sec. 18-30n-30e. Drlg. 1,150 ft.
R. G. Parrent No. 1 Hartman, C NW SE sec. 12-24n-25e. Drlg. 898 ft.

Petroleum County

O. B. Canfield No. 1 Govt. CEL SE NE sec. 21-17n-24e. Rng. 3-in. to set at 750 ft.

Roosevelt County

The Poplar dome in the northeastern part of the state is to have another test in John W. Schmidt and others No. 1 Frye, 5 miles northwest of the town of Poplar. The town of Poplar has given Schmidt a natural gas franchise. This dome was tested in 1928 in the Pioneer Oil & Gas Co.'s well in section 35-27n-51e. Hole was lost at 3,085 feet.

Toole County

There were two completions and one new operation in the Kevin-Sunburst field. The Shaver Oil Co. No. 3 Shaver, SW SE NE section 11-34n-2w, was dry in the contact and was plugged back to the Sunburst at 1,480-90 feet and completed as a gas well, estimated at 2,000,000 feet a day.

Agen & Krause Co. No. 1 Krause, SE cor. section 9-35n-3w, failed to respond to acid in the contact at 1,800-21 feet and was plugged back to the Sunburst at 1,580 feet and was completed as a small gas well.

New Era Fuel Co. No. 1 Goeddertz, CWL SE NW sec. 12-35n-3w. Drlg. 920 ft.
A. C. Crumley No. 12 Shaw, SE NE NW sec. 35-36n-2w. Spdg.
A. C. Crumley No. 7 Jarrett, NE SE NE sec. 29-35n-2w. Drlg. 900 ft.
Stanley Gray No. 1 Goeddertz, CWL NE SW sec. 12-35n-23w. Drlg. 440 ft.
A. C. Carney No. 1 Stockman, CWL SE NE sec. 11-35n-2w. Drlg. 800 ft.
Capitol Oil Co. No. 1 Pace, C SE SW sec. 27-36n-1w. Skidded rig; drlg. 80 ft. in new hole.
S. V. Day No. 3 Halter, NE NE NE sec. 17-35n-2w. Rig.
Consolidated Gas Co. No. 5 fee, SE SE NW sec. 29-35n-2w. Drlg. 1,460 ft. (cor. farm name).
J. W. Perrin No. 1 Hogan, SW NE NW sec. 11-35n-3w. Drlg. 1,325 ft.
Lamont Pet. Co. No. 1 Van Note, NE NE NW sec. 30-35n-2w. Contact 1,509-12 ft.; dry, will acid.
Twin Buttes Synd. No. 1 Thompson, NW NE NW sec. 33-35n-3w. Drlg. 1,650 ft.
Nepstad & Vanderpas No. 2 Solberg, SW NE sec. 29-35n-3w. Drlg. 1,640 ft.
Welch Bros. No. 2 Larum, SW SW NW sec. 25-35n-3w. T.D. 1,658 ft.; repairing engine.
Watson et al No. 2 Leach, SE NE NE sec. 31-35n-3w. Drlg. 1,400 ft.
Big West Oil Co. No. 7 Dahlquist, NW SE NE sec. 21-35n-3w. Sunburst, 1,550-70 ft.; 2,000,000 ft. gas; will save and D.D.
A. Beardslee No. 6 Swears, SW SE NW sec. 9-35n-2w. Drlg. 600 ft.
Browning-Sunburst 32 Synd. No. 1 Goeddertz, NW NW SW sec. 21-36n-3w. Drlg. 860 ft.
Wm. McKnight No. 2 Havland, CWL SE NW sec. 19-35n-2w. Contact 1,574-1,626 ft.; S.O.; will acid.
Rimrock Oil Co. No. 1 Govt., CEL SW NW sec. 29-35n-3w. Moving in material.
W. S. Knight No. 1 Gunderson, SW SE NW sec. 9-35n-2w. S.D. in Ellis-Madison contact at 1,572 ft.
Bryant Bros. No. 1 Lashbaugh, NE SW NW sec. 34-25n-2w. T.D. 850 ft.; R.U. heavier machine to resume.
Ogden-Kevin Oil Co. No. 7 Zachot, SE SW NW sec. 20-35n-1w. S.D. 400 ft.

A Half-Told TALE

In this fair land there are many power plants that never have scale and corrosion troubles. They eliminate these obsolete hazards by the certain . . . safe . . . and simple use of—

SAND BANUM

"The Entirely Different Boiler and Engine Treatment"

This pure colloidal concentrate has taught them the meaning of really efficient and economical steam. A FEW OUNCES from one to four times per month in each boiler does away with scale and corrosion, shutdowns, tube replacements, water analyses, unnecessary work and uncertainty!

Sand-Banum is available to all interested parties on our "Satisfaction or No Money" guarantee.

Send for booklet "HOW and WHY" and then YOU write the *happy ending to this tale* in your own plant!

AMERICAN SAND-BANUM COMPANY, Inc.
9 Rockefeller Plaza New York City

Stocks carried by

WESTERN SAND-BANUM COMPANY
Houston, Texas Fresno, Calif.
and at other convenient points including leading supply houses.

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ontario, May 22.—Deliveries from the Turner Valley field to the Calgary refineries in April totaled 149,467 bbls., comprising 94,035 bbls. of crude and 55,432 bbls. of naphtha. This compared with 133,216 bbls. in March and 76,615 bbls. in April of last year. For the four months of 1937 total deliveries were 500,357 bbls. against 306,575 bbls. in the same period of 1936.

Of the April deliveries, British American Oil Co. took 4,241 bbls. of naphtha and 47,386 bbls. of crude, and Imperial Oil Refineries took 3,668 bbls. clear naphtha, 47,523 bbls. of discolored naphtha and 46,649 bbls. of crude.

West Central Field

In West Central Turney Valley, Dalhousie Oil Co. No. 9, LSD 6, section 30-19-2w5, is cleaning out at 6,269 feet for a test of the Dalhousie sand after failing to get production in the lime. R. A. Brown and associates are sponsoring a second test of the Madison lime in this area, to be located probably on the east side of section 19-19-2w5.

In section 5-19-2w5, Mercury Royalties No. 1, LSD 8, is resuming with rotary tools from 2,822 feet. Mercury Oils No. 8, LSD 3, section 4-19-2w5, is resuming with rotary from 2,800 feet.

In section 33-18-2w5, Royalite Oil Co. No. 5 Sterling Pacific, LSD 12, is below 4,205 feet.

In section 21-18-2w5, Davies Petroleums-Royalite No. 2, LSD 13, is in the Benton formation below 3,034 feet. Newfold Royalties No. 1, LSD 11, bottoming in the Madison lime at 6,254 feet with a daily production around 20 bbls of 68 gravity naphtha was shot with 510 quarts. The wet gas flow was considerably increased and naphtha recovery is being tested.

In section 20-18-2w5, Spy Hill Royalties No. 1, sponsored by the Anglo Canadian Holding & Development Co., has been spotted in LSD 16. It will start with cable tools and later change to rotary. Royal Canadian Oils No. 1, LSD 15, is spudding. Monarch Royalties No. 1, LSD 9, is below 4,996 feet, and will probably be the first completion in the southwest extension of the field.

Sunset Oils No. 1, LSD 10, section 20-18-2w5, encountered a fair flow of dry sweet gas in the Belly River formation at 1,080 feet, below a coal horizon. It is deepening for 13-inch casing below 1,282 feet. Brown Oil Corp. No. 2, LSD 8, offsetting Monarch Royalties No. 1 to the south, is below 2,569 feet.

In section 16-18-2w5, Richwell Oil Co. No. 1, LSD 5, is below 150 feet.

In the far south, National Petroleum Co. No. 2, LSD 14, section 9-18-2w5, is below 924 feet. This test is located 1½ miles south of Foundation No. 1, the nearest crude producer.

Test Western Extension

While the west side drilling in the South Turner Valley crude oil area is largely along the eastern boundary of sections 17 to 32, and farther east, two new tests are planned for a considerable distance west of this line. Okalta Royalties No. 1, sponsored by Okalta Oils of Calgary, has tentative location in LSD 5, section 30-18-2w5, about 2 miles west of Turner Valley Royalties No. 1 crude producer. Turner Westflank Syndicate of Calgary is incorporating a company with Dominion charter to drill in LSD 15, section 18-18-2w5, 1¼ miles west of the nearest drilling in the southwest extension, and about 2 miles southwest of the nearest production.

High River-Aldersyde

On the Cayley dome in the High River area, east of Turner Valley, Arca Development Corp. No. 1, NW section 24-18-1w5, has cemented off sulfur water encountered in the Madison lime at 8,987 feet and is preparing to test production in the upper limestone and the Dalhousie sand.

On the Aldersyde structure, Ranchmen's Oil & Gas Co. No. 1, LSD 16, section 13-20-29w4 is below 7,215 feet with continued small oil shows.

On the New Valley structure, McLeod Oil Co. No. 1, LSD 4, section 6-21-2w5, is below 7,362 feet after cementing off a crude flow encountered in the Cardium sand. Production will be taken from this horizon after the hole has been drilled into the Blairmore formation.

Weymarn Production Test

On the Mill Creek structure west of Pincher Creek, in the southern foothills, Weymarn Petroleums No. 2, LSD 5, section 7-6-1w5, bottoming at 5,960 feet, is bailing rotary mud for production test. While standing idle the rotary mud caked in the hole, making bailing difficult. Increasing quantities of high grade amber crude have been encountered with some gas, production apparently coming from the Upper Dalhousie sand, and additional showings are expected when a cement plug above the Lower Dalhousie at 4,660 feet is drilled through.

Tests in the Foothills

In the Forest Reserve area west of Olds, Hunter Valley Oil Co. No. 1 McLaren, LSD 12, section 13-31-10w5, is in the Fernie shales below 7,511 feet with strong shows of oil and gas through the rotary mud. It is expected to get the Madison limestone around 7,600 feet.

On the Duncan structure Spindletop Oils No. 1, LSD 4, section 1-30-6w5, is below 230 feet after setting 21½-inch casing at 197 feet. Location is about 55 miles northeast of Calgary and 27 miles west of Carstairs, and about 15 miles southwest of the Monarch deep well drilled in 1914.

On the Birch Ridge structure, Elbow Oils No. 1, LSD 11, section 35-22-5w5, is in the Dalhousie formation below 5,090 feet and preparing to run casing.

On the Highwood-Sinclair structure, south and west of Turner Valley, South End Petroleums No. 1, LSD 6, section 36-18-3w5, is reaming to bottom at 4,525 feet preparatory to deepening, after setting casing at 4,325 feet.

Moose Dome Test

On the Moose dome, west of Calgary, Moose Oils No. 2, LSD 8, section 29-22-6w5, standing cemented at 750 feet, will be completed by Devonian Petroleums, Ltd., organized by a Vancouver and Calgary group headed by W. F. Irwin & Co. Drilling on the Moose dome starts in the Banff shales, which underlie the Madison limestone, the productive horizon of the Turner Valley field; and the Devonian, the potential producing formation, is encountered at about 200 feet. Moose Oils No. 1, about one-half mile north of No. 2, got a strong gas flow and considerable light crude in the Devonian, but was abandoned below 2,800 feet owing to drilling difficulties. Gas from No. 1 will be used for drilling No. 2.

Border Fields

On the Del Bonita structure south of Lethbridge, Sunshine Oils No. 1, LSD 10, section 19-1-21w4, bottoming in the Madison limestone at 5,282 feet, was given a shot which failed to increase production. The well had a fair show of 39-gravity crude in the lime, but is not rated a commercial producer.

On the South Twin River structure, Del Bonita Associated Oils No. 3, LSD 9, section 10-2-20w4, is resuming from 3,988 feet, where casing was cemented 10 feet in the lime.

In the Taber field, Taber Petroleum, Ltd., has started core drilling operations with Geologist Joseph S. Irwin of Calgary in charge. Plains Petroleum No. 2, LSD 14, section 25-9-17w4, has derrick up. Alco Oils, Ltd., of Calgary will drill a test if results of Plains No. 2 prove promising.

West of Lethbridge, Lethbridge Petroleums & Refining No. 1, NW quarter section 11-8-22w4, is spudding, with Empire Drilling Co. of Calgary handling the contract.

In the Steveville district, east of Calgary, Union Drilling Co. is moving equipment for Anaconda Oil Co. No. 1, LSD 15, section 6-9-22w4.

British Columbia Project

In southeastern British Columbia, Couldrey Creek Oils, Ltd., of Vancouver will drill on acreage west of the Flathead River, with Crow's Nest Oils, Ltd., taking an interest in the test. The Pre-Cambrian overthrust, which results in thicker formations and deeper drilling on the eastern side of the Flathead area, is absent on the west side of the valley on Burnham and Couldery Creeks, and production is expected around 2,000 feet. Contract has been let to a Spokane company for 2,000 feet of hole for $22,000 with $31,500 if 3,000 feet of drilling are required. Diamond drill equipment will be used.

Drilling Contractors

(Continued from Page 177)

Beaumont field for the Stanolind Oil & Gas Co. and completion tests are scheduled to be made during the week. No. 1 J. W. Hall is being completed from a screen setting through perforations at 5,352-67 feet; No. 1 McCormick is standing cemented with 7-inch casing at 5,356 feet, while No. 2 Sargir is running screen after a drill stem test at 5,982-86 feet showed pipe line oil.

THERE ARE DEFINITE REASONS

Why the BAKER Model F CEMENT RETAINER Provides a *Better, Quicker, Safer Way* to

PLUG BACK & RECEMENT

•

CEMENT IN SERIES

•

TEST UPPER CASED FORMATIONS

•

PERFORM SQUEEZE JOBS

•

CEMENT UNDER PRESSURE

•

PLUG OFF BOTTOM FLUIDS

•

CEMENT BEHIND PIPE

and do Repair Work of All Kinds .... These reasons are fully brought out in the BAKER BROADCAST No. 17, which describes and illustrates the design, construction, operation and many successful *laboratory and field proven* applications of this efficient device.

Every oil executive and field man interested in the vital subject of cementing should have this complete treatise on file.

You can get your copy by simply signing and returning this coupon .... But *DO IT NOW* as the supply is limited.

BAKER Model F CEMENT RETAINER
and Casing Bridge Plug

BAKER OIL TOOLS, INC.

Please send me a copy of the Baker Broadcast No. 17. I understand this request incurs no obligation on my part.

NAME _____

COMPANY _____

POSITION _____

ST. ADDRESS _____

CITY _____ STATE _____

Michigan Field Report

TWO FIELDS RECORD THEIR LARGEST PRODUCING WELLS

By
PAUL A. ELLIOTT

MUSKEGON, Mich., May 24.—Effects of Michigan's greatest oil and gas drilling campaign, chiefly in the state's greatest new oil field in Buckeye Township, Gladwin County, were felt last week when 24 new completions and eight wells deepened, treated or nearly completed tests added 13,971 bbls. of crude oil daily and 67,000,000 feet of natural gas open flow.

Sixteen oil producers, two new gassers and six dry holes were completed, or drilled into production, in 17 townships of 11 counties throughout the Lower Peninsula of the Wolverine state, a record of activity unequalled since boom days in the Porter Township, Midland County field, in 1933-1934, and seldom equalled then.

Highlights of the week included: Completion of the largest producer in the Buckeye field; indicated extensions of this field more than a mile in two and perhaps three directions; completion of the largest well in west Michigan since the days of flush production in the Muskegon field in 1928-30 and the addition of nearly 13,000 bbls. of new oil production in a single field—Buckeye.

It was a week packed full of surprises and exciting developments for all phases of the oil industry in Michigan where the discovery of 50 more oil pools was predicted recently at the annual meeting of the production division, eastern district of the American Petroleum Institute.

Buckeye Field

C. W. Teater, who brought in the Porter field in February, 1933, struck the largest initial flow yet encountered in the Buckeye-Gladwin field when his No. 8 Domokos, first one drilled on the lease, SE SW NW section 11-18n-1w, a half mile north and a quarter mile west of the Wicklund discovery well of the northeast sector of the field, was given a potential rating of 3,504 bbls. daily in the Dundee limestone.

Starting off at 103 bbls. the first hour, the flow increased to 156 bbls. the seventh hour, it was reported by O. H. White, new proration umpire for the area, who gave it the high natural rating.

Second largest completion of the week was the Elzie Beaver, Trustee, No. 2-B State, SW NE NE section 14, also in the northeast sector, which made a natural initial of 2,592 bbls. a day from the Dundee.

Two others completed for about 1,800 bbls. daily, the Sun Oil Co. No. 5 Salla, NE NW SW section 11, and the Mammoth Producing and Refining Corp. No. 4-A State, SE NE NW section 14. The former, a south offset to the Teater-Domokos, was increased, however, from a previously estimated flow of 1,200 bbls. daily, so merely added 600 bbls. of new initial. It flowed between 75 and 80 bbls. an hour, naturally, from a depth of 3,619 feet. The latter made about the same per hour.

Buckwin Oil Co., which previously held the high record for any well in the field, brought in No. 4 State, NE NW SE section 11, for an initial of 60 bbls. an hour, or about 1,400 bbls. a day, topping the Dundee at 3,545 feet, striking the first show at 3,607 feet, the second at 3,617 feet and completing at 3,627 feet. It is the last of four wells drilled on the 40-acre lease north of the discovery well. Ten other new Dundee producers in the Buckeye field ranged from 100 to 1,000 bbls. daily.

Indicating one of the best producers in the field was the flow of 929 bbls. initial from the Sun Oil Co. No. 1 Raab, NE SE NE section 10, two locations west and one north of the Teater-Domokos, with tools still in the hole.

Buckeye Extensions

The northeast sector of Buckeye was extended more than a mile when Mammoth Petroleum Corp. brought in the No. 1 Manyet, SE NE SW section 3 for 400 bbls. daily after acidizing.

A similar extension of the southeast, or Oard sector, was indicated when Max Pray and T. F. Caldwell, Inc., struck a flow of 100 bbls. the first hour in No. 1 Flynn, SW SW NW section 4-17n-1e, Billings Township. After five hours, when the well had flowed 235 bbls., it stopped and two days of swabbing put only 83 bbls. in the tank. It was put on the pump to test the Dundee topped at 3,495 feet with first pay at 3,570 feet and second from 3,598 feet to 3,602 feet, bottom of the hole.

Farthest to the west in the proved area, the Daily Crude Oil Co. brought in No. 2 Jakab, NW SW SE section 10, for 200 bbls. initial after acid treatment. Limestone was topped at 3,572 feet and drilling suspended at 3,657 feet. No. 1 Jakab was increased from 225 bbls. to 325 bbls. a day at a total depth of 3,780 feet.

Sun Oil Co. struck an initial flow of 32 bbls. an hour, conservatively estimated good for 600 bbls. a day, in the No. 1 Ockerman, SE NW SE section 10, at 3,632 feet, or 73 feet in the Dundee, but was to be deepened before final completion.

Two smaller wells also were completed in the southeast sector by Elzie S. Beaver, Trustee, the No. 4 Havens, SW NW NW section 36 and the No. 4 Upton, SW SE NW section 36, making about 375 bbls. each. The former topped the Dundee at 3,534 feet and both completed at about 3,600 feet.

Socony-Vacuum Oil Co., Inc., was swabbing No. 1 Dailey, SW SE NW section 12, Buckeye, for 100 bbls. a day and was to be treated with acid.

Wicklund Development Co., which opened the northeast sector, had from 1,700 to 3,000 feet of oil in the hole in three tests, namely: No. 2-B State, SE SW NE section 11; No. 1-D State, NW NW NE, same section, and No. 2-C State, SE SW NW section 12, all to be completed this week following acid treatment.

Other Townships

Sun company also struck an interesting show in the No. 2 Hines, NW SW NW section 31-17n-1w, Tobacco Township, Gladwin County, which made 17½ bbls. of oil in the first 24 hours and six the following day. Preparations were made to test it further on the pump before acidizing.

M. F. Whitehill, who opened the first Gladwin County oil field in Beaverton Township more than two years ago, completed another small well in that field, the No. 4 King, NE SW SW making 45 bbls. natural initially topping the Dundee at 3,829 feet and drilling to 3,891 feet before plugging back to 3,888 feet for completion. It may be treated later.

Buckeye "Dusters"

Two dry holes marked the week's drilling in Buckeye Township, one setting a limit 2½ miles northwest of the Wicklund pool and the other to the southeast of the same sector. Voorhees Drilling Co. No. 1 L. W. Estes, NE SW SE section 5-18n-1w, reported no show in the Dundee from the top of the limestone at 3,703 feet to 3,790 feet. The other dry hole, No. 1 Clare C. Tubbs, completed by the Mammoth Producing & Refining Corp., NW NW SW section 13, 1½ miles northeast of the so-called "Tattle Tale" well drilled by Hanner Development Co. No. 1 Armstrong, NE NW SW section 23, last week reported making between 350 and 450 bbls. daily on the pump, within three-fourths of a mile southwest of another producer and a half mile southeast of the Oard pool.

West Michigan

Most important development of the week, outside of the Buckeye area, was the completion of the fourth and largest Upper Traverse oil producer in the new Salem Township, Allegan County field, about 50 miles south of Muskegon, for an initial flow of about 600 bbls. daily.

Muskegon Oil Corp. and others No. 1 W. Moomey, SE NW SE section 17-4n-13w, made 489 bbls. during the first 20 hours and was rated good for 600 bbls. initially. Upper Traverse lime was topped at 1,566 feet with 6 feet of pay from 1,584½ to 1,590½ feet.

No. 1 Moomey attracted much attention to western Michigan possibilities, as it was the largest well struck in the western part of the state since the Muskegon field was brought in with a 240-bbl. Upper Traverse well December 15, 1927.

Two and possibly three more tests will be drilled into the Upper Traverse this week: Muskegon Oil Corp. No. 2 W. Moomey, NW NE SE section 17, and Lentz & Miller, Inc., No. 1 M. Brenner, SW NW NW section 16 and No. 1 Buege, SE SW NE section 17. The two Muskegon concerns each have started another test in the field, while two wildcats have been started near the south edge of the county by the Champion Development Co.

Lentz & Miller, Inc. more than doubled the output of No. 1 Baker and others Berea gasser, C NE section 6-9n-14w, in the Ravenna Township, Muskegon County field for the West Michigan Consumers Co. Muskegon Development Co. will complete another into the Berea this week, the No. 1 Niza, C NW section 5, for the West Michigan company, which controls the field.

John B. Northcott announced resumption of drilling in the former E. C. Nelson, Inc. No. 1 Williams, NE NE NE section 8-14n-16w, Ferry Township extension test, more than a mile southeast of the old Elbridge Township, Oceana County, Traverse pool.

A new West Michigan wildcat test also has been started by the Muskegon Development Co. for Charles Strange and the Marquette River Development Co., of Big Rapids, in section 12, Home Township, Newaygo County.

Clayton-Arenac

Gordon Oil Co. completed No. 2 Crandall, NW NE SE section 10-20n-4e, for 225 bbls. from the Dundee as the only completion in the Clayton Township, Arenac County field.

Isabella County

Pure Oil Co. finished a small Dundee well in the Sherman Township, Isabella County field, the No. 2 Latham, NW NW SE section 33-15n-6w, making 90 bbls. daily at 3,693 feet.

Morris Oil & Gas Corp. completed No. 1 Dimon, temporarily in the Traverse formation, for 30 bbls. a day after a second acid treatment

Socony-Vacuum Oil Co., Inc. boosted an initial flow of 373,000 feet of gas from the Michigan Stray sands in No. 1 Murphy, C E half SE NE section 6-16n-3w, a Wise Township, Isabella County wildcat, to 700,000 feet daily with a second shot. It was completed at 1,323 feet in the shallow formation topped at 1,313 feet.

Other Gassers

John Mercier, who with James McKay, opened the Clare County gas field several years ago, brought in No. 2 Bicknell, C NW SW section 6-17n-4w, Grant Township, for an open flow of 1,460,000 feet daily in the Marshall topped at 1,405 feet with pay from 1,413 to 1,416 feet and bottom at 1,421 feet.

Two gassers previously drilled into the Michigan Stray sands in Tri-Townships field of Millbrook-Hinton-Belvidere townships, Mecosta and Montcalm counties, were increased 65,000,000 feet daily. Fletcher & Leman No. 1 Tiffany in section 32-13n-7w, Millbrook Township, Mecosta County, made 49,000,000 feet after deepening from an original flow of 4,850,000 feet, while the Wolverine Natural Gas Corp. No. 2 Lumbert, C SW NW section 11-12n-7w, Belvidere-Montcalm, was rated 55,000,000 feet compared with 35,000,000 feet, the original flow recently encountered. The latter was drilled in the Michigan formation from 1,216 to 1,257 feet.

(Continued on Page 210)

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Shell Oil, No. 1-21 Capitan, Santa Barbara Co.	32- 5-30	2,655	rig. to pump
Shell Oil, No. 1-22 Capitan, Santa Barbara Co.	32- 5-30	2,490	O.S. drlg.
Barnsdall-Richfield, No. 19-B Elwood, Santa Barbara	15- 4-29	4,555	hd. sh. drlg.
Hancock-Bush, No. 1-B Santa Maria, Santa Barbara	26-10-34	4,790	br. sh. drlg.
Union Oil, No. 1-R Santa Maria, Santa Barbara	21-10-34	2,184	sd. sh. drlg.
Union Oil, No. 3-V Santa Maria, Santa Barbara	30-10-33	3,370	sd. sh. drlg.
Union Oil, No. 3-23-E Santa Maria, Santa Barbara	23-10-34	3,638	sd. sh. drlg.
Union Oil, No. 18 Orcutt, Santa Barbara Co.	26- 9-34	3,930	sd. sh. drlg.
Rice Ranch Oil, No. 4 Orcutt, Santa Barbara Co.	23- 9-34	3,753	br. sh. drlg.
Valley Oil, No. 1 Casmalia, Santa Barbara Co.	20- 9-34	1,912	idle
Arnold Oil, No. 2 Los Alamos, Santa Barbara Co.	8- 8-33	1,665	sd. sh. drlg.
Moyle, B. A., No. 1 Gato Ridge, Santa Barbara	4- 8-32	3,225	bailing
Stewart-Carter Oil, No. 1 Gato Ridge, Santa Barbara	4- 8-32	3,601	br. sh. drlg.
Petrol Corp., No. 43-A Gato Ridge, Santa Barbara Co.	9- 8-32	2,400	sd. sh. drlg.
York Oil, No. 3-A Lompoc, Santa Barbara Co.	33- 8-34	1,030	br. sh. drlg.
Fisher, Dan, No. 1 Cuyama, Santa Barbara Co.	28-11-28	646	idle
Oatman Mining, No. 1 Mesa, Santa Barbara Co.	28- 4-27	997	sd. sh. drlg.
Petroleum Securities, No. 5 Ranch, Shiells, Ventura	3- 3-19	3,743	sd. sh. drlg.
Texas Co., No. 129 Shiells, Ventura Co.	4- 3-19	4,812	cleaning out
Texas Co., No. 132 Shiells, Ventura Co.	4- 3-19	3,900	sd. sh. drlg.
Union Oil, No. 16 Bardsdale, Ventura Co.	12- 3-20	3,815	sd. sh. drlg.
Condor Oil, No. 1 Sespe, Ventura Co.	6- 4-19	1,810	br. sh. drlg.
Ivers, H. A., No. 14 Star, Sespe, Ventura Co.	1- 4-20	612	sd. sh. drlg.
Topa Topa Oil, No. 2 Sespe, Ventura Co.	33- 5-19	3,451	sd. sh. drlg.
Speik Oil, No. 2 Sespe, Ventura Co.	33- 5-19	2,309	br. sh. drlg.
Colima Oil, No. 2 Sespe, Ventura Co.	25- 5-19	2,340	sd. sh. drlg.
Bolsa Chica Oil, No. 1-H Temescal, Ventura Co.	5- 4-18	3,681	br. sh. drlg.
Pacific Western Oil, No. 8 Temescal, Ventura Co.	4- 4-18	2,165	sd. sh. drlg.
Vai, Giovani, No. 1 Ojai, Ventura Co.	4- 4-21	294	hd. sd. drlg.
Texas Co., No. 1 Saticoy, Ventura Co.	31- 3-21	191	sd. sh. drlg.
Continental Oil, No. 1 Red Mountain, Ventura Co.	7- 3-23	7,054	hd. sh. drlg.
Continental Oil, No. 7 San Miguelito, Ventura Co.	23- 3-24	5,384	sd. sh. drlg.
C. C. M. Oil, No. 2 Padre Canyon, Ventura Co.	23- 3-24	6,465	redrlg. 3,690
Continental Oil, No. 3 Padre Canyon, Ventura Co.	15- 3-24	5,892	hd. sh. drlg.
El Rio Oil, No. 1 Oxnard, Ventura Co.	6- 1-21	2,717	sd. sh. drlg.
Tide Water A. O., No. 31 V.L.W., Ventura, Ventura	24- 3-23	1,533	sd. sh. drlg.
Tide Water A. O., No. 29 Lloyd, Ventura, Ventura	27- 3-23	6,921	sd. sh. drlg.
Tide Water A. O., No. 60 Lloyd, Ventura, Ventura	27- 3-23	5,866	sd. sh. drlg.
Tide Water A. O., No. 64 Lloyd, Ventura, Ventura	27- 3-23	6,940	sd. sh. drlg.
Tide Water A. O., No. 66 Lloyd, Ventura, Ventura	27- 3-23	5,197	sd. sh. drlg.
Tide Water A. O., No. 81 Lloyd, Ventura, Ventura	27- 3-23	7,600	rigged up
Tide Water A. O., No. 137 Lloyd, Ventura, Ventura	27- 3-23	6,900	sd. sh. drlg.
Shell Oil, No. 91 Taylor, Ventura, Ventura Co.	30- 3-23	4,773	sd. sh. drlg.
Shell Oil, No. 35 Gosnell, Ventura, Ventura Co.	28- 3-23	8,770	O.S. drlg.
General Pet., No. 17 Barnard, Ventura, Ventura Co.	23- 3-23	7,030	redrlg. 7,020
Den Petroleum, No. 1 Devils Den, Kern Co.	20-25-19	4,230	br. sh. drlg.
Goodrum, George, No. 1 Devils Den, Kern Co.	24-25-18	351	idle
Texas Co., No. 3 Theta, Lost Hills, Kern Co.	11-26-20	660	sd. sh. drlg.
Amerada Pet., No. 4 Blackwell Corner, Kern Co.	17-26-19	788	sd. sh. drlg.
Santa Ynez Oil, No. 1 Temblor, Kern Co.	36-29-20	482	cmtd. 482
Franco Western Oil, No. 13 McKittrick, Kern Co.	8-30-22	1,860	sd. sh. drlg.
East Puente Oil, No. 2-11 McKittrick, Kern Co.	11-30-21	975	sd. sh. drlg.
Welport Oil, No. 18 McKittrick, Kern Co.	26-29-21	1,178	pump. 95 b.d.
Seaboard Oil, No. 1 Wasco, Kern Co.	26-27-24	9,087	coring
Belridge Oil, No. 3-35 North Belridge, Kern Co.	35-27-20	6,087	sd. sh. drlg.
Belridge Oil, No. 24-35 North Belridge, Kern Co.	35-27-20	7,970	br. sh. drlg.
Belridge Oil, No. 21-1 North Belridge, Kern Co.	1-28-20	8,280	O.S. drlg.
Continental Oil, No. 9 North Belridge, Kern Co.	36-27-20	3,690	sd. sh. drlg.
Tide Water Associated, No. 6 North Belridege, Kern	34-27-20	5,050	br. sh. drlg.
Texas Co., No. 1 Martin, North Belridge, Kern Co.	22-27-20	5,048	cleaning out
Honolulu Oil, No. 20 Round Mountain, Kern Co.	20-28-29	1,976	sd. sh. drlg.
Honolulu Oil, No. 33 Round Mountain, Kern Co.	18-28-29	2,037	pump. 197 b.d.
Pageman & Hennes, No. 1 Round Mountain, Kern Co.	10-28-29	1,520	dry; abd.
Shell Oil, No. 1-11 Olcese, Round Mountain, Kern Co.	17-28-29	1,950	cmtd. 1,896
Republic Pet., No. 15-S Kern Front, Kern Co.	24-28-27	2,035	pump. 254 b.d.
Italo Petroleum, No. 36 Kern Front, Kern Co.	16-28-27	2,913	rig. to pump
Apex Pet., No. 10-2 Kern Front, Kern Co.	10-28-27	2,193	sd. sh. drlg.
Oil, Inc., No. 7-2 Kern Front, Kern Co.	13-28-27	1,289	P.B. 1,247
Barnhart & Morrow, No. 3 K.C.L., Kern Front, Kern	11-28-27	1,962	rig. to pump
California Star Oil, No. 8-40 Kern Front, Kern Co.	22-28-27	1,797	sd. sh. drlg.
H. C. L. Co., No. 1 Kern Front, Kern Co.	36-28-27	1,484	P.B. 1,462
McDonald & Dearin, No. 4 Kern Front, Kern Co.	10-28-27	981	sd. sh. drlg.
Texas Co., No. 7 Lehman, Kern Front, Kern Co.	23-28-27	2,125	sd. sh. drlg.
Superior Oil, No. 1 Bakersfield, Kern Co.	36-29-28	5,234	P.B. 3,156
Sunset Oil, No. 1 Union Avenue, Kern Co.	17-30-28	5,382	sd. sh. drlg.
Wilshire Oil, No. 1 F. P., Union Avenue, Kern Co.	36-29-27	691	cmtd. 691
Ring Oil, No. 29-2 Bowles, Mount Poso, Kern Co.	29-26-28	1,715	sd. sh. drlg.
C. C. M. Oil, No. 1 Carter, Mount Poso, Kern Co.	7-27-27	962	sd. sh. drlg.
Chevalier, J. J., No. 3 S.P., Mount Poso, Kern Co.	3-27-28	1,475	rig. to pump
Desert Glow Oil, No. 1 Mount Poso, Kern Co.	14-27-27	1,021	sd. sh. drlg.
Hobbee Oil, No. 1 Mount Poso, Kern Co.	14-27-27	1,258	O.S. drlg.
Hub Oil, No. 1 Mount Poso, Kern Co.	8-28-28	3,125	idle
Vanguard Oil, No. 7 Baker, Mount Poso, Kern Co.	33-27-28	1,287	sd. sh. drlg.
Shell Oil, No. 19 Security, Mount Poso, Kern Co.	16-27-28	715	sd. sh. drlg.
Shell Oil, No. 12 Vedder-Rail, Mount Poso, Kern Co.	9-27-28	1,784	O.S. drlg.
Western Gulf Oil, No. 3-S.W. Fruitvale, Kern Co.	27-29-27	3,442	sd. sh. drlg.
Wilbur, V. R., No. 1 Fruitvale, Kern Co.	22-29-27	1,751	sd. sh. drlg.
Sandy Oil, No. 2 Fruitvale, Kern Co.	26-29-27	2,966	sd. sh. drlg.
Pal-Pen Oil, No. 2 Fruitvale, Kern Co.	23-29-27	3,193	O.S. drlg.
Crude Oil Prod., No. 1 Fruitvale, Kern Co.	21-29-27	4,136	bailing
Magee, H. H., No. 2 Fruitvale, Kern Co.	23-29-27	3,154	pump. 197 b.d.
Meridian Oil, No. 3-T Fruitvale, Kern Co.	23-29-27	3,113	pump. 128 b.d.
American Expl., No. 1-G Mountain View, Kern Co.	18-30-29	4,792	P.B. 4,722
Savoy Oil, No. 2-W Mountain View, Kern Co.	34-30-29	1,546	sd. sh. drlg.
Tracy Drlg., No. 1-B Mountain View, Kern Co.	19-30-29	1,582	sd. sh. drlg.
Ohio Oil, No. 5-D Mountain View, Kern Co.	33-30-29	3,776	sd. sh. drlg.
Hogan Pet., No. 4 Symons, Mountain View, Kern Co.	5-31-29	6,188	cleaning out
Hogan Pet., No. 3 Bankline, Mountain View, Kern Co.	4-31-29	2,996	sd. sh. drlg.
Greer, P. H., No. 2 Perrel, Mountain View, Kern Co.	9-31-29	3,772	sd. sh. drlg.
Mohawk Pet., No. 4 Earl, Mountain View, Kern Co.	4-31-29	3,981	sd. sh. drlg.
Monterey Expl., No. 6 Duff, Edison, Kern Co.	15-30-28	3,450	sd. sh. drlg.
Cajalco Pet., No. 1 Brown, Edison, Kern Co.	9-30-30	971	sd. sh. drlg.
Arkelo Oil, No. 1 Lerdo, Kern Co.	23-28-26	10,050	fish. D.P.
Union Oil, No. 1-34 Rio Bravo, Kern Co.	34-28-25	8,097	sd. sh. drlg.
Continental Oil, No. 1 Rosedale, Kern Co.	12-29-26	8,051	hd. sd. drlg.
Standard Oil, No. 11-2 Greeley, Kern Co.	20-29-26	8,339	P.B. 7,725
Standard Oil, No. 11-4 Greeley, Kern Co.	20-29-26	1,170	sd. sh. drlg.
Standard Oil, No. 11-5 Greeley, Kern Co.	20-29-26	7,497	sd. sh. drlg.
Standard Oil, No. 12-1 Greeley, Kern Co.	30-29-26	7,886	testing
Union Oil, No. 3 San Emidio, Kern Co.	28-11-22	2,505	sd. sh. drlg.
Shell Oil, No. 21-14 Old River, Kern Co.	14-30-25	7,840	sd. sh. drlg.
Shell Oil, No. 58-29 Ten Section, Kern Co.	29-30-26	1,887	sd. sh. drlg.
Ohio Oil, No. 2-E Ten Section, Kern Co.	6-30-26	1,895	sd. sh. drlg.
Superior Oil, No. 8 Ten Section, Kern Co.	11-30-26	12,160	sd. sh. drlg.
C. C. M. Oil, No. 2-W.P., Midway-Sunset, Kern Co.	28-32-23	1,852	deepening
C. C. M. Oil, No. 34-21 Midway-Sunset, Kern Co.	21-32-23	1,840	br. sh. drlg.
B-Zone Oil, No. 1 Midway-Sunset, Kern Co.	22-32-23	3,087	br. sd. drlg.
Midcrude Oil, No. 2 Midway-Sunset, Kern Co.	22-32-23	2,135	pump. 40 b.d.
Colby, L. W., No. 1 Midway-Sunset, Kern Co.	12-11-24	1,287	br. sh. drlg.
Standard Oil, No. 48-33-D Midway-Sunset, Kern Co.	33-32-24	2,898	sd. sh. drlg.
Standard Oil, No. 125-33-D Midway-Sunset, Kern Co.	33-32-24	2,720	pump. 192 b.d.
Standard Oil, No. 126-33-D Midway-Sunset, Kern Co.	33-32-24	2,274	sd. sh. drlg.
Shell Oil, No. 3 McKeon, Midway-Sunset, Kern Co.	22-32-23	1,806	sd. sh. drlg.
Tide Water A. O., No. 5 P.C., Midway-Sunset, Kern	32-31-23	2,481	sd. sh. drlg.
Texas Co., No. 20 Midway-Sunset, Kern Co.	32-32-24	2,944	bailing
Texas Co., No. 21 Midway-Sunset, Kern Co.	32-32-24	2,870	bailing
Western Mesa Oil, No. 35 Midway-Sunset, Kern Co.	14-31-22	1,724	sd. sh. drlg.
General Pet., No. 49-B Midway-Sunset, Kern Co.	24-31-23	4,495	C.P. 4,430
Hancock Oil, No. 6 Midway-Sunset, Kern Co.	8-11-23	3,192	will P.B.
Ninkovich, Gus, No. 2 Ohio, Midway-Sunset, Kern Co.	23-32-23	1,498	sd. sh. drlg.
Quality Oil, No. 2-W.P., Midway-Sunset, Kern Co.	27-32-23	1,291	sd. sh. drlg.
Honolulu Oil, No. 54 Midway-Sunset, Kern Co.	14-32-24	3,530	flow. 545 b.d.
Evans, Hugh, No. 16 Midway-Sunset, Kern Co.	35-32-23	2,230	cleaning out
Reserve Oil & Gas, No. 33-4 Tejon, Kern Co.	33-11-19	3,696	sd. sh. drlg.
Reserve Oil & Gas, No. 2-6 Tejon, Kern Co.	2-10-19	2,683	dry; abd.
Ohio Oil, No. 2 Tejon, Kern Co.	21-11-19	8,450	br. sh. drlg.
Western Gulf, No. 2 Cantua, Fresno Co.	3-17-15	6,580	swabbing
Union Oil, No. 2 King, Kettleman North, Fresno Co.	29-21-17	8,500	reaming
K. N. D. A., No. 4-18-J Kettleman North, Fresno Co.	18-21-17	10,135	sd. sh. drlg.
K. N. D. A., No. 56-28-J Kettleman North, Fresno Co.	28-21-17	7,786	sd. sh. drlg.
K. N. D. A., No. 67-28-J Kettleman North, Fresno Co.	28-21-17	5,642	br. sh. drlg.

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Bldg., building.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
Br. sh., brown shale.
B.S., basic sediment.
C.P., casing pressure.
Cd. or Crd., cored.
C.D., corrected depth.
Cg., coring.
C.L., center line.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg. or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
L.D.D., later drilled deeper.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., old well drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging or plugged back.
P.B.P., pulling big pipe.
P.L., pipe line.
P.L.O., pipe line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.R.T., rigging up rotary tools.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sd. sh., sandy shale.
Sdtr., or St., sidetracking.
S.D.P.L., shut down for pipe line.
S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing).
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T.P., tubing pressure.
Tr., tract.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C. or W.O.C.S., waiting on cement to set.
W.P., working pressure.
W.S.O., water shutoff.
W.S.O.O.K., water shutoff O.K.
W.S.O.N.G., water shutoff no good.
W.S.R. or W.O.S.R., wait on standard rig.
Wtr., water.

K. N. D. A., No. 78-28-J Kettleman North, Fresno Co.	28-21-17	7,190	cmtd. 7,175	
K. N. D. A., No. 2-34-J Kettleman North, Fresno Co.	34-21-17	6,196	br. sh. drlg.	
K. N. D. A., No. 32-34-J Kettleman North, Fresno Co.	34-21-17	6,580	br. sh. drlg.	
K. N. D. A., No. 63-34-J Kettleman North, Fresno Co.	34-21-17	7,865	flow. 2,560 b.d.	
K. N. D. A., No. 61-4-P Kettleman North, Fresno Co.	4-22-17	7,398	sd. sh. drlg.	
Standard Oil, No. 38-33-J Kettleman North, Fresno	33-21-17	7,975	flow. 330 b.d.	
Standard Oil, No. 41-33-J Kettleman North, Fresno	33-21-17	601	sd. sh. drlg.	
Standard Oil, No. 81-22-J Kettleman North, Fresno	33-21-17	7,476	sd. sh. drlg.	
Standard Oil, No. 4-3-P Kettleman North, Fresno	3-22-17	4,884	sd. sh. drlg.	
Standard Oil, No. 78-3-P Kettleman North, Kings	3-22-17	7,705	sd. sh. drlg.	
Temblor Oil, No. 1-B Kettleman Middle, Kings Co.	25-23-18	5,935	redrlg. 5,870	
Clare, A. S., No. 1 Corcoran, Kings Co.	30-20-22	992	sd. sh. drlg.	
Dudley Ridge Dev., No. 2 Dudley Ridge, Kings Co.	24-24-20	781	sd. sh. drlg.	
Barnsdall Oil, No. 1 K.C.L., San Luis Obispo Co.	1-32-20	5,217	fish. D.P.	
Burkholder Oil, No. 1 Clay, San Luis Obispo Co.	14-10-26	3,250	idle	
Calif. Producing, No. 1 Pattiway, San Luis Obispo	19-10-24	751	idle	
Temblor Oil, No. 1 Panorama, San Luis Obispo Co.	22-32-21	1,464	gr. sd. drlg.	
Lewis, A. O., No. 1 Pecho, San Luis Obispo Co.	34-30-10	2,576	br. sh. drlg.	
Gretna Corp., No. 1 Isley, San Luis Obispo Co.	24-30-10	1,116	sd. sh. drlg.	
Pismo Pet., No. 1 Pismo, San Luis Obispo Co.	5-32-13	4,420	idle	
Shell Oil, No. 1 Pleyto, Monterey Co.	34-24-10	8,994	P.B. 8,750	
Shell Oil, No. 2 Pleyto, Monterey Co.	34-24-10	8,572	sd. sh. drlg.	
Texas Co., No. 2 Eureka, Humboldt Co.	22- 3- 1	7,708	hd. sh. drlg.	
Amerada Pet., No. 1 Marks, Rio Vista, Solano Co.	24- 4- 2	4,388	gas sand	
Tide Water A. O., No. 1 Sargent, San Benito Co.	5-12- 4	6,921	P.B. 5,988	
Buttes Oilfields, Ltd., No. 1 Kent, Sutter Co.	2-15- 1	5,810	fish. D.P.	
Jennings, E. P., No. 1 Allensworth, Tulare Co.	4-24-23	2,709	will P.B.	

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Richfield Oil, No. 5 El Segundo, Los Angeles Co.	18- 3-14	7,513	flow. 1,440 b.d
Richfield Oil, No. 1 S.F., El Segundo, Los Angeles	18- 3-14	7,640	cmtd. 7,567
Ohio Oil, No. 3 El Segundo, Los Angeles Co.	7- 3-14	7,094	dry; abd.
Texas Co., No. 2-2 El Segundo, Los Angeles Co.	17- 3-14	7,240	sd. sh. drlg.
Texas Co., No. 2 Security, El Segundo, Los Angeles	18- 3-14	7,259	sd. sh. drlg.
Standard Oil, No. 1 Refy, El Segundo, Los Angeles	13- 3-15	6,272	sd. sh. drlg.
Republic Pet., No. 8 El Segundo, Los Angeles Co.	18- 3-14	6,998	hd. sh. drlg.
Signal Finance, No. 1 Hawthorne, Los Angeles Co.	10- 3-14	9,395	cleaning out
Calizoo Oil, No. 1 S.L.A., Los Angeles Co.	16- 3-13	4,884	hd. sd. drlg.
Abrams, John & Assoc., No. 1 Torrance, Los Angeles	16- 4-14	4,258	flow. 120 b.d.
Weber-Butler Oil, No. 2 Torrance, Los Angeles Co.	16- 4-14	4,232	sd. sh. drlg.
McLaren & Assoc., No. 1 Palos Verdes, Los Angeles	27- 4-14	3,992	redrlg. 1,950
Country Club Oil, No. 1 Inglewood, Los Angeles	19- 2-14	2,950	idle
Standard Oil, No. 83 Inglewood, Los Angeles Co.	8- 2-14	3,677	O.S. drlg.
Shell Oil, No. 90 Reyes, Dominguez, Los Angeles	33- 3-13	9,598	O.S. drlg.
Shell Oil, No. 91 Reyes, Dominguez, Los Angeles	33- 3-13	981	cmtd. 976
Union Oil, No. 50 Callender, Dominguez, Los Angeles	33- 3-13	10,435	cleaning out
Union Oil, No. 52 Callender, Dominguez, Los Angeles	33- 3-13	6,297	cmtd. 6,265
Union Oil, No. 55 Callender, Dominguez, Los Angeles	33- 3-13	3,671	sd. sh. drlg.
Union Oil, No. 7 Carson, Dominguez, Los Angeles	33- 3-13	7,765	sd. sh. drlg.
Union Oil, No. 46 Heliman, Dominguez, Los Angeles	33- 3-13	5,290	completing
Barnsdall Oil, No. 12 O'Dea, Rosecrans, Los Angeles	18- 3-13	6,054	recmtd. 6,035
Union Oil, No. 16 Rosecrans, Los Angeles Co.	18- 3-13	5,970	sd. sh. drlg.
Universal Consd., No. 1-T Rosecrans, Los Angeles	18- 3-13	2,131	sd. sh. drlg.
Bolsa Chica Oil, No. 1 Rosecrans, Los Angeles	20- 3-13	988	sd. sh. drlg.
Metropolitan Oil, No. 1 Playa Del Rey, Los Angeles	34- 2-15	6,296	sd. sh. drlg.
Union Oil, No. 17 D.R., Playa Del Rey, Los Angeles	27- 2-15	5,934	sd. sh. drlg.
Burt, A. G., No. 1 Newhall, Los Angeles Co.	36- 4-17	1,354	sd. sh. drlg.
Barnsdall Oil, No. 1 S.F., Newhall, Los Angeles	26- 4-17	6,472	cleaning out
Holbrook Pet., No. 1 Newhall, Los Angeles Co.	28- 4-16	5,298	sd. sh. drlg.
Premier Pet., No. 1 Wilmington, Los Angeles Co.	33- 4-13	3,500	flow. 170 b.d.
General Pet., No. 3 Ford, Wilmington, Los Angeles	4- 5-13	5,096	deep test
General Pet., No. 6 Ford, Wilmington, Los Angeles	4- 5-13	1,691	sd. sh. drlg.
General Pet., No. 7 Ford, Wilmington, Los Angeles	4- 5-13	3,250	sd. sh. drlg.
General Pet., No. 8 Ford, Wilmington, Los Angeles	4- 5-13	2,986	sd. sh. drlg.
General Pet., No. 3-P Wilmington, Los Angeles	4- 5-13	2,497	sd. sh. drlg.
General Pet., No. 3-T Wilmington, Los Angeles	4- 5-13	2,310	sd. sh. drlg.
Graham Loftus Oil, No. 1-P Wilmington, Los Angeles	33- 4-13	711	sd. sh. drlg.
Hall, Inc., No. 20-7 Wilmington, Los Angeles Co.	33- 4-13	2,576	sd. sh. drlg.
Hall, Inc., No. 484-1 Wilmington, Los Angeles Co.	33- 4-13	137	sd. sh. drlg.
O'Donnell, J. E., No. 41 Wilmington, Los Angeles	32- 4-13	2,594	sd. sh. drlg.
Bankline Oil, No. 29-P.T., Wilmington, Los Angeles	33- 4-13	2,198	sd. sh. drlg.
Bankline Oil, No. 7-2 Wilmington, Los Angeles	33- 4-13	1,991	sd. sh. dr'g.
Burnoel Oil, No. 1-T Wilmington, Los Angeles Co.	33- 4-13	982	sd. sh. drlg.
Holly Dev., No. 1 Wilmington, Los Angeles Co.	33- 4-13	3,581	sd. sh. drlg.
Jergins Trust, No. 1 Wilmington, Los Angeles Co.	34- 4-13	3,030	sd. sh. drlg.
Jergins Trust, No. 2 Wilmington, Los Angeles Co.	34- 4-13	3,042	cleaning out
Jergins Trust, No. 6 Wilmington, Los Angeles Co.	34- 4-13	1,942	sd. sh. drlg.
Jergins Trust, No. 7 Wilmington, Los Angeles Co.	34- 4-13	3,028	sd. sh. drlg.
Jergins Trust, No. 12 Wilmington, Los Angeles Co.	34- 4-13	2,198	sd. sh. drlg.
Midland Pet., No. 5 Wilmington, Los Angeles Co.	5- 5-13	2,191	fish. D.C.&B.
Interstate Inv., No. 1-K Wilmington, Los Angeles	5- 5-13	3,745	P.B. 3,630
Crude Oil Drlg., No. 1-M Wilmington, Los Angeles	33- 4-13	2,251	sd. sh. drlg.
Leal, G. V., No. 1 Wilmington, Los Angeles Co.	33- 4-13	3,410	sd. sh. drlg.
Olympic Ref., No. 1 fee, Wilmington, Los Angeles	33- 4-13	3,510	pump. 142 b.d.
Olympic Ref., No. 3 Wilmington, Los Angeles	33- 4-13	2,190	sd. sh. drlg.
Pacific Western, No. 2-P Wilmington, Los Angeles	32- 4-13	3,555	flow. 550 b.d.
Pac. Western, No. 1 Petsec, Wilmington, L. Angeles	33- 4-13	330	sd. sh. drlg.
Pac. Western, No. 2 Petsec, Wilmington, L. Angeles	33- 4-13	411	sd. sh. drlg.
Pacific Western, No. 1-W, Wilmington, Los Angeles	33- 4-13	1,997	sd. sh. drlg.
Packard Pet., No. 20-8-1 Wilmington, Los Angeles	33- 4-13	2,591	sd. sh. drlg.
Packard Pet., No. 20-8-3 Wilmington, Los Angeles	33- 4-13	2,180	sd. sh. drlg.
Sonwell Oil, No. 1 Wilmington, Los Angeles Co.	32- 4-13	2,635	sd. sh. drlg.
Ring Oil, No. 3 Wilmington, Los Angeles Co.	33- 4-13	2,600	sd. sh. drlg.
Royalty Service, No. 20-5 Wilmington, Los Angeles	33- 4-13	3,575	bailing
Royalty Service, No. 16-7 Wilmington, Los Angeles	33- 4-13	3,609	flow. 480 b.d.
Royalty Service, No. 5-C Wilmington, Los Angeles	33- 4-13	3,610	flow. 168 b.d.
Royalty Service, No. 7-C Wilmington, Los Angeles	32- 4-13	2,664	sd. sh. drlg.
Royalty Service, No. 3-N Wilmington, Los Angeles	33- 4-13	2,895	sd. sh. drlg.
Royalty Service, No. 4-N Wilmington, Los Angeles	33- 4-13	3,541	flow. 1,003 b.d.
Royalty Service, No. 23-7-1 Wilmington, Los Angeles	33- 4-13	3,600	sd. sh. drlg.
Union Pacific, No. 6 Wilmington, Los Angeles Co.	33- 4-13	3,242	sd. sh. drlg.
Union Pacific, No. 11 Wilmington, Los Angeles Co.	4- 5-13	3,915	C.P. 3,175
Union Pacific, No. 12 Wilmington, Los Angeles Co.	4- 5-13	2,875	sd. sh. drlg.
Union Pacific, No. 13 Wilmington, Los Angeles Co.	4- 5-13	2,419	cmtd. 2,384
Union Pacific, No. 14 Wilmington, Los Angeles Co.	3- 5-13	3,934	P.B. 3,661
Union Pacific, No. 15 Wilmington, Loc Angeles Co.	34- 4-13	2,656	cmtd. 2,620
Union Pacific, No. 17 Wilmington, Los Angeles Co.	4- 5-13	3,523	flow. 670 b.d.
Union Pacific, No. 21 Wilmington, Los Angeles Co.	34- 4-13	1,855	sd. sh. drlg.
Wilbur, V.R.G., No. 1-W Wilmington, Los Angeles	28- 4-13	3,580	pump. 102 b.d.
Western States Drlg., No. 2 Wilmington, Los Angeles	33- 4-13	1,540	sd. sh. drlg.
Godsford Oil, No. 1-W Wilmington, Los Angeles	33- 4-13	3,265	flow. 450 b.d.
Sunrise Pet., No. 1 Wilmington, Los Angeles Co.	33- 4-13	3,553	pump. 170 b.d.
Richfield Oil, No. 2 Ciocca, Montebello, Los Angeles	5- 2-11	2,860	sd. sh. drlg.
Richfield Oil, No. 1 Estrada, Montebello, Los Angeles	5- 2-11	4,113	fishing
Texas Co., No. 17 Baldwin, Montebello, Los Angeles	6- 2-11	3,580	sd. sh. drlg.
Universal Consd., No. 1-F Montebello, Los Angeles	5- 2-11	4,531	sd. sh. drlg.
Texas Co., No. 21-F Long Beach, Los Angeles Co.	19- 4-12	3,975	sd. sh. drlg.
Clayton, G. L., No. 1 North Long Beach, Los Angeles	32- 3-12	5,050	sd. sh. drlg.
General Pet., No. 27 Santa Fe Springs, Los Angeles	5- 3-11	4,540	sd. sh. drlg.
Union Oil, No. 100 Santa Fe Springs, Los Angeles	6- 3-11	10,789	fish. D.P.
Standard Oil, No. 28 S. G., Seal Beach, Orange Co.	11- 5-12	5,950	sd. sh. drlg.
Tide Water A. O. Co., No. 16-B Seal Beach, Orange	11- 5-12	3,921	sd. sh. drlg.
Lucky Strike Oil, No. 8 Huntington, Orange Co.	2- 6-11	2,630	whipstock
Holly Oil, No. 7-A Huntington, Orange Co.	35- 5-11	4,060	rig. to pump.
Texas Co., No. 9 Brown, Huntington, Orange Co.	11- 6-11	3,276	sd. sh. drlg.
Tide Water O. A., No. 55 M. K. Huntington, Orange	2- 6-11	3,500	sd. sh. drlg.
West American, No. 14 Huntington, Orange Co.	34- 5-11	4,110	sd. sh. drlg.
Orco Oil, No. 5 Huntington, Orange Co.	2- 6-11	4,697	D.P. stuck
Union Oil, No. 9-C Huntington, Orange Co.	34- 5-11	1,990	sd. sh. drlg.
Commander Oil, No. 1 Newport, Orange Co.	29- 6-10	7,450	br. sh. drlg.
Standard Oil, No. 63 Emery, West Coyote, Orange	24- 3-11	4,173	pump. 300 b.d.
Hogan Pet., No. 1 McNally, West Coyote, Orange	23- 3-11	5,730	sd. sh. drlg.
Bandini Pet., No. 1-B East Coyote, Orange Co.	24- 3-10	3,590	O.S. drlg.
Bartholomae Oil, No. 4 East Coyote, Orange Co.	22- 3-10	3,283	sd. sh. drlg.
Kelly, Thomas, No. 11 East Coyote, Orange Co.	24- 3-10	3,485	sd. sh. drlg.
Union Oil, No. 20 Hole, East Coyote, Orange Co.	22- 3-10	4,830	sd. sh. drlg.
Standard Oil, No. 2-10 East Coyote, Orange Co.	22- 3-10	3,300	sd. sh. drlg.
Joseph, Arthur, No. 1 Richfield, Orange Co.	29- 3- 9	3,740	P.B. 3,710
Union Oil, No. 10 Morse, Richfield, Orange Co.	29- 3- 9	2,983	cmtd. 2,940
Union Oil, No. 9 Coyle, Richfield, Orange Co.	29- 3- 9	1,092	sd. sh. drlg.
Principal Oil, No. 1 Richfield, Orange Co.	36- 3- 9	2,391	sd. sh. drlg.
Signet Oil, No. 1 Yorba, Orange Co.	21- 3- 9	962	sd. sh. drlg.
West American Oil, No. 1 Tustin, Orange Co.	14- 5- 9	3,099	sd. sh. drlg.

KANSAS

Week Ending May 22 (Descriptions are East unless marked otherwise)

Barber County

Barbara Oil Co. No. 1-27 Holmes, C NW NW sec. 27-33-13w. R.U.R.

Pryor & Lockhart No. 1 Gant, C SE sec. 7-31-13w. Set 12-in. 607 ft.; W.O.C. 621 ft.

Barton County

S. E. Bailey No. 1 Hammeke, NE NE SW sec. 12-18-12w. O.W.D.D.; S.D. 2,100 ft.

C. L. Carlock No. 1 Ehly, NE NE SE sec. 5-18-11w. T.D. 3,397½ ft.; P.B. 3,368 ft.; D.&A.

Continental Oil Co. No. 1 Lamatsch, SW NE NE sec. 26-17-12w. Sil. 3,369 ft.; T. D. 3,405 ft.; D.&A.

George Dickey et al No. 1 Boger, SE SE NE sec. 15-16-13w. Drlg. 3,125 ft.

J. B. Hanna No. 1 Luce, SW cor. sec. 21-20-13w. R.U.R.

Magnolia Pet. Co. No. 1 Zink, NW NW SE sec. 13-18-11w. K.C. 2,999 ft.; drlg. 3,302 ft.

Sam Murphy No. 1 Beck, NE cor. sec. 17-17-12w. Rig.

C. L. Price et al No. 1 Kraft, SW NW NE sec. 10-17-11w. Sil. 3,281 ft.; T.D. 3,288½ ft.; acd.; P. 60 B.O. in 18 hrs.

Republic Nat. Gas Co. and Continental Oil Co. No. 1 Moeder, NE NE SW sec. 25-17-13w. Anhy. 729 ft.; S.D. 1,060 ft.

Stanolind O. & G. Co. No. 1 Meggars, SW cor. sec. 21-20-11w. T.D. 3,373 ft.; D.&A.

Stanolind O. & G. Co. No. 1 Struder, SE SE SW sec. 26-16-13w. K.C. 3,154 ft.; cg. 3,218 ft.

Vickers Pet. Co. et al No. 1 Leibel, SE NE SE sec. 18-18-11w. Cong. 3,385 ft.; Simp. 3,465-69 ft.; T.D.; D.&A.

E. F. Wakefield et al No. 1 Scheuerman, NE NE SW sec. 31-16-15w. Anhy. 1,070 ft.; Topeka 2,925 ft.; K.C. 3,286 ft.; drlg. 3,510 ft.

C. H. Weaver et al No. 1 Stumps, NE cor. sec. 3-17-12w. Sil. 3,365 ft.; T.D. 3,383 ft.; D.&A.

Butler County

Kahn et al No. 1-A Madden, SW SW NE sec. 27-23-4. K.C. 2,065 ft.; T.D. 2,225 ft.; P. 20 B.O. and 60 B.W. 24 hrs.; acd.

Simpson Oil Co. et al No. 1-A Dennis, NE NE SW sec. 15-26-6. Drlg. 490 ft.

Maurer & Saco Oil Co. No. 1 Connell, NE NE SW sec. 27-29-5e. R.U.

Vickers Pet. Co. No. 1 Voth, C N½ NE NE sec. 32-24-4e. Drlg. 3,014 ft.

Chase County

Propp et al No. 1 Fromm, SE cor. sec. 29-18-9e. L. 2,510 ft.; drlg. 2,735 ft.

Chautauqua County

C. L. Broslus et al No. 1 Garrett, NW SW NW sec. 26-32-11. Spdd.

Buffington and Cohen No. 1-A Hayes, SE NE SE sec. 10-33-13. Drlg. 1,025 ft.

Robinson et al, No. 1 Foster, SW cor. sec. 6-33-12. Drlg. 1,325 ft.

Ira Scott et al No. 1 Lamba, SW NW NE sec. 18-33-13. Drlg. 1,530 ft.

E. J. Shaffer No. 1 Nuckolls, NW cor. sec. 12-33-19. Miss. 2,360 ft.; drlg. 2,428 ft.

Cowley County

B. B. Blair et al No. 1 Miller, NE NW SW sec. 14-32-5. Drlg. 435 ft.

Bess & Gralapp et al No. 1 Wakefield, NE SE SW sec. 18-30-6. K.C. 2,204 ft.; sd. 2,839-49 ft.; drlg. 2,886 ft.

Elmer Ash et al No. 1 Bolack, NW NW SE sec. 22-32-6. K.C. 2,236 ft.; drlg. 2,580 ft.

Murta & Wilson No. 1 Turner, NE NE NW sec. 30-32-6. U.R. 10-in. 1,648 ft.

McCoy et al No. 1 Anderson, SE NW NE sec. 34-34-6. Fsg. 1,685 ft.

Palmer et al No. 1 Ogrosky, SE SE NW sec. 31-32-5. Drlg. 1,300 ft.

Tulsa Oil Co. et al No. 1 Dillon, NW NW NE sec. 28-34-3. Rig.

J. N. Wallace No. 1-A fee. SW SE SE sec. 10-33-4. Wtr. 1,435-50 ft.; D.&A.

Decatur County

C. L. Bruce et al No. 1 Newbold, C NE SE sec. 34-2s-28w. R.U.R. and S.D.

Edwards County

Royal Pet. Co. et al No. 1 Krupp, NW NW SE sec. 18-24-19w. Topeka 3,580 ft.; K. C. 4,083 ft.; drlg. 4,230 ft.

Elk County

G. T. Berry No. 1 Zimmerman, SW NE SE sec. 15-30-10. Drlg. 375 ft.

Republic Nat. Gas Co. No. 1 Glasscock, SE NE SW sec. 19-31-11. R.U. mach.

Ellis County

Billings No. 1 Smith, SE SE NW sec. 14-12-16w. Drlg. 2,395 ft.

Bridgeport Machine Co. et al No. 1 Froelick, NW NW SE sec. 4-13-16w. S.O. 3,260-65 ft.

Elwell and Tree Oil Co. No. 1 Wickham, SW SW NE sec. 10-11-19w. Sil. 3,645 ft.; cg. 3,654 ft.

Ted Kors et al No. 1 Kobiltz, SE SW NW sec. 23-12-18w. Pay 3,694-98 ft.; swb. 48 B.O. and swbd. down; T.D. 3,699 ft.; P. 210 B.O. in 24 hrs.; pot. 250 B.O.; comp.

Lario O. & G. Co. et al No. 1 Henderson, SW SW NE sec. 27-11-18w. Topeka 3,030 ft.; drlg. 3,213 ft.

J. J. Muth No. 1 Penney, NW SE SE sec. 29-14-18w. Spd. and S.D.

Noble Pet. Corp. No. 1 O'Laughlin, NW NW SE sec. 13-12-19w. Sil. 3,900-43 ft.; T.D.; wtr.; S.D.O.

J. C. Shaffer, Inc., No. 1 Staab, SE cor sec. 25-12-18w. Topeka 3,180 ft.; cg. 3,389 ft.

Twin Drlg. Co. et al No. 1 Craig, NE NE SE sec. 6-11-16w. Ft. Riley 1,995 ft.; drlg. 3,008 ft.

Ellsworth County

Frost et al No. 1 Dolechek, NE NE SW sec. 36-14-8w. Rng. 5-in. 3,308 ft.

Orville Lea No. 1 Larkin, NW cor. sec. 15-16-8w. Topeka 2,275 ft.

Greenwood County

B. & B. Oil Co. No. 1 Webb, C NE SE sec. 3-26-13. Fsg. 1,115 ft.

L. S. Bolwanz No. 1 Travelers, C SW SW sec. 23-26-10. H.F.W. 2,000-10 ft.; D.&A.

Van Deventer et al No. 1-A Bemis, NE SW SE sec. 12-28-11. T.D. 1,315 ft.; D.&A.

Ward McGinnis et al No. 1 Henly Estate. SW cor. sec. 25-25-9. Fsg. 1,500 ft.

Hamilton County

Denver Prod. & Ref. Co. No. 1 Porter. SW SW NE sec. 30-25-41w. Drlg. 2,545 ft.

Harper County

Carter Oil Co. et al No. 1 Seihart Est., C SW NW sec. 4-34-8w. Cg. 5,202 ft.

Harvey County

Bell O. & G. Co. et al No. 1 Austin, SE NE NE sec. 28-23-1e. Rig.

E. I. Shaffer et al No. 1 Epp, SE cor. sec. 15-23-3w. Rig.

Shaffer & Shawver No. 1 Hege, NE NE SE sec. 26-22-2w. Chat 2,983-3,027 ft.; T.D.; S.D.O.

Simpson & Noble et al No. 1 Pierce, SW SE NE sec. 25-22-2w. Spdd.

Kearny County

J. L. Murphy No. 1 Masonic Home, C NW sec. 1-26-36w. R.U.R.

Logan County

W. H. Boucher No. 1 Wright, C SE SE sec. 12-15-35w. Miss. 4,655 ft.; S.O. 4,850-60 ft.; drill pipe stuck 4,910 ft.

Lyon County

Davis & Sory No. 1 Byrd, SW SW SE sec. 32-21-11. S.D. 590 ft.

Young et al No. 1-A Murphy, SE NW NE sec. 32-21-11. S.D. 1,380 ft.

McPherson County

C. E. Ash Drilling Co. No. 1 Broman, NE NE NW sec. 19-17-4w. Rig.

Bradley Bros. No. 1 Barnholt, SW SW SE sec. 30-30-5w. K.C. 2,720 ft.; drlg. 2,740 ft.

Fred C. Frank et al No. 1 Doles, SE NW NE sec. 12-19-1w. S.D. 600 ft.

Smith et al No. 1 Larson, NW NW SW sec. 35-18-5w. Drlg. 2,130 ft.

Wamhoff et al No. 1 Nuse. SE NE SW sec. 18-18-4w. Set 10-in. 110 ft.; W.O.C.

Mitchell County

Geo. Siedhoff et al No. 1 Greiss, SW SW SE sec. 16-8-10w. Rng. 6-in. 3,011 ft.

Ness County

Jones & Lane No. 1 Page Milling Co., SE SE NW sec. 36-18-26w. Rig.
Newton Dev. Co. No. 1 Tenny, NW NW SE sec. 19-18-25w. U.R. 6-in. at 4,379 ft.

Osborne County

J. E. Waldron No. 1 Neuschwanger, SE NE NW sec. 11-8-14w. Spd. and S.D.

Reno County

Imo O. & G. Co. and others No. 1 Watkins, SE cor. sec. 14-22-7w. Drlg. 1,700 ft.
Clyde Pulse No. 1 Payne, SW NW SE sec. 4-22-7w. Set 6-in. 3,243 ft.; W.O.C.
Sinclair Prairie Oil Co. No. 1 Natt, NW NW SE sec. 32-26-4w. Viola 4,032 ft.; Wilcox 4,057 ft.; drlg. 4,137 ft.
Westgate-Greenland Oil Co. No. 1 O'Sullivan, SW SW NE sec. 24-23-5. Sil. 3,945-70 ft.; D.&A.

Rice County

Comanche Oil Co. No. 1 Cramm, SW SW SE sec. 15-19-9w. Drlg. 1,850 ft.
L. E. Douglass No. 1 Coyne, NE SE SE sec. 24-21-8w. Cong. 3,365 ft.; Chat 3,386 ft.; T.D. 3,438 ft.; oil in hole.
Empire O. & R. Co. No. 1 Bredfeldt, C N½ N½ SW sec. 7-18-9w. Sil. 3,223 ft. (cor.); T.D. 3,240 ft.; acd.; pot. 267 B.O.; comp.
John Hanna et al No. 1 Fulton, NW NW NE sec. 24-10-6w. K.C. 2,835 ft.; U.R. 8-in. at 3,142 ft.
Hipple et al No. 1 Wernet, NE NE NW sec. 11-20-6w. Tarkio 1,825 ft.; drlg. 2,085 ft.
Fred Phillips et al No. 1 Hubenett, SW NW SW sec. 23-20-6w. Drlg. 3,082 ft.
Shell Pet. Corp. et al No. 1 Haxton B, NE NE SW sec. 29-18-9w. Drlg. 2,791 ft.
C. E. W. Skiles et al No. 1 Helmer, NW NW NE sec. 7-19-18w. S.D. 1,800 ft.
Union Oil & Refining Co. et al No. 1 Baker, SW SW NE sec. 33-20-6w. Chat 3,395 ft.; drlg. 3,427 ft.
W. E. Witt et al No. 1 Fair, NW SE SE sec. 4-22-8w. Rng. 10-in. 1,890 ft.

Rooks County

Basin Oil Co. No. 1 Baxa, NE cor. sec. 23-9-17w. Simp. 3,620-20 ft. T.D.
Brunson Drlg. Co. et al No. 1 Casey, SE SE NE sec. 22-9s-16w. Set 8-in. 2,430 ft.
C. R. Craft et al No. 1 Ziegler, NE NE SW sec. 8-10-16w. Drlg. 2,189 ft.
Graham et al No. 1 Fike, SW cor. sec. 9-9-17w. T.D. 3,301 ft.; fsg.
S. C. Hoel et al No. 1 Ives, SW SW NE sec. 11-7-18w. S.D. 485 ft.
Jones Bros. No. 1 Wiss, NW cor. sec. 8-10-18w. U.R. 6-in. 3,370 ft.
J. H. Lester No. 1 Methene, SE SE NE sec. 29-10-20w. Fsg. 3,818 ft.

Rush County

Duwe & Brouk No. 1 Lebsack, SE SE NE sec. 13-16-16w. Drlg. 1,985 ft.
S. A. Murphy et al No. 1 Roth, NW NW SW sec. 21-16-18w. Drlg. 3,635 ft.
Westgate-Greenland Oil Co. et al No. 1 Greenwalt, NW NW NE sec. 19-19-16w. Anhy. 1,220 ft.; drlg. 2,940 ft.

Russell County

Aylward et al No. 1 Jones SE SE NW sec. 23-14-13w. Drlg. 1,600 ft.
Equity Gas Co. No. 1 Harbaugh, NW NE SW sec. 19-13-12w. Drlg. 2,490 ft.
Goldstein and Vernon Oil & Gas Co. No. 1 Steinert Estate, NE SE NW sec. 34-15-15w. Drlg. 1,590 ft.
S. M. Murphy et al No. 1 Deines, SE SE SW sec. 36-15-15w. Topeka 2,875 ft.; S.D. 3,075 ft.

Scott County

Olson Drlg. Co. et al No. 1 Nolan, NW NW NE sec. 13-19-33w. Drlg. 4,301 ft.

Sedgwick County

Cameron et al No. 1 Smith, SW SE SE sec. 13-27-2e. Sil. 3,230-72 ft.; P.B. 2,388 ft.
Roxana Drlg. Co. et al No. 1 Woodman, SW NW SW sec. 26-26-1w. S.D. 2,469 ft.
E. B. Shawver No. 1 Furman, SW NE SE sec. 24-29-3w. T.D. 1,865 ft.; skidded 15 ft. N; R.U.

Stafford County

Atlantic Ref. Co. No. 1 Kachelman, SE NW NW sec. 13-25-14w. Rig.
W. P. Faulkner No. 1 Schulz, SE SE NE sec. 6-22-13w. R.U.
Rose Spring Drlg. Co. et al No. 1 Gray, NW cor. sec. 11-24-13w. Rig.

Sumner County

John Burton et al No. 1 Springate, NE NE SW sec. 30-33-2e. Rig.
Glimac Oil Co. et al No. 1 Proud, SW SE SE sec. 33-30-1w. K.C. 2,970 ft.; drlg. 3,070 ft.
Graham et al No. 1 Dawson, NW NW NW sec. 4-33-2w. Base Miss. 4,250 ft.; fsg. 4,255 ft.
Texas Co. No. 1 Harner, NE SW SE sec. 9-20-3w. Viola 4,625 ft.; set 6-in. 4,273 ft.; C.O.

Trego County

W. I. Southern, Inc., No. 1 Latimer, NW NW SE sec. 19-15-22w. Anhy. 1,695 ft.; drlg. 3,225 ft.

Woodson County

M. B. Allen No. 1 Flack, NE NE NW sec. 1-26-14. Sd. 1,313-42 ft.; T.D. 2,300,000 ft. gas.
B. & B. Oil Co. No. 1 Lockard, NW NW NE sec. 2-26-13e. Machine.
Kansas O. & G. Corp. No. 1 Providence, SW SW SE sec. 6-24-15. T.D. 1,643 ft.; D.&A.

Pontotoc County

Boettcher O. & G. Co. No. 1 Cann, SE NW NE sec. 25-4n-7e. Spudded.
Caloma Oil Co. No. 1 Brentz, SE NE SW sec. 4-1n-6. T.D. 1,010 ft.; S.D.
Clark Drlg. Co. et al No. 1 Richardson, SE SE NW sec. 30-4-8. Set 12½-in. at 143 ft.; R.U.R.
Papoose Oil Co. et al No. 1 Jones, NW SE NW sec. 2-4-5. Viola 2,595 ft.; T.D. 2,840 ft.; run Schlumberger.
Roodhouse et al No. 1 Booth, SE NW SE sec. 20-2-6. Set 10¾-in. csg. 296 ft.; W.O.C.
Southern Oil Co. No. 1 Young, NE NE SE sec. 17-3-7. Machine.
Summit Drlg. Co. et al No. 1 Whittaker, NW NE SE sec. 31-4-6. Drlg. 1,090 ft.

Pottawatomie County

Atlantic Ref. Co. No. 1 Dooley, SE SE SW sec. 9-11-5. Rig.
Mid-Continent Pet. Corp. No. 1-A Logan, NE NE SE sec. 31-11-5. Wilcox 4,839 ft.; T.D. 4,844 ft.; P.O.P.
Mid-Continent Pet. Corp. No. 1 Ne-Thah-Pea-Se, SE SE NE sec. 24-11-4. Spdd.
Stanolind O. & G. Co. and Amerada Pet. Corp. No. 1 Billington-B, SW SE SW sec. 32-9-3e. Drlg. 1,600 ft.

Pushmataha County

Erle Halliburton et al No. 1 Bagwell, SW NE NE sec. 30-3s-15e. Drlg. 1,643 ft.

Seminole County

Amerada Petroleum Corp. and Stanolind Oil & Gas Co. No. 1 Reed, SE SW SE sec. 19-10-8. T.D. 3,618 ft.; S.D.O.
Sinclair Prairie Oil Co. No. 1 Rossanna, NW NW SW sec. 28-10-8. Wilcox 4,176 ft.; T.D. 4,189 ft.; acd.; F. 1,317 B.O. in 12 hrs.; cutting 3.6% wtr.; comp.

Texas County

Cabot Carbon Co. No. 1 Calvert, C sec. 14-3n-16ecm. Drlg. 2,643 ft.
Cabot Carbon Co. No. 1 Castro, C SE sec. 19-3n-17ecm. T.D. 2,570 ft.; 3,600,000 ft. gas at 2,690 ft.; plugging back.
Missouri Valley Gas Corp. No. 1 well, C sec. 17-6n-14ecm. S.D. 2,257 ft.

Washita County

John Koberg No. 1 Harms, NW NW NE sec. 6-10-16w. Drlg.
L. P. McWhirter No. 1 fee, NW SW SW sec. 34-8-19w. T.D. 1,810 ft.; S.D.

SOUTHERN OKLAHOMA

Comanche County

E. B. Hane No. 1 Duper, NW cor. sec. 21-2n-13w. S.D. 250 ft. for csg.
Frank Scott No. 1-A Kuntz, SE NE SE sec. 21-4n-11w. T.D. 2,450 ft.; S.D.

Jefferson County

A. T. Campbell et al No. 2 Trout, NE SE NE sec. 6-8s-7w. T.D. 2,206 ft.; abd.
Heenan & Coe et al No. 1 Rose, C SW SW sec. 1-5s-5w. Drlg. 4,895 ft.
Massad & Swansberger No. 1 Barrett, NE cor. SE SE sec. 14-6s-6w. T.D. 1,842 ft.; S.D.

Love County

Sinclair Prairie Oil Co. No. 1 Stockton SE SE SW sec. 26-6s-2w. T.D. 8,583 ft.; P.B. 6,927 ft.; C.O.

Marshall County

Stuart & Taylor No. 1 Chestnut, NE cor sec. 23-8s-5e. T.D. 788 ft.; P.B. 787 ft · tstd. 30 B.O. and 6 B.W. in 24 hrs.; S.D.

Murray County

O. O. Owens No. 1 Fryer, NE SE NE sec. 34-1s-3e. T.D. 1,452 ft.; S.D.
Power Oil Co. et al No. 1 Lancaster Trust, C SW NE sec. 10-1s-2e. T.D. 3,438 ft.; P.B. to 3,175 ft.; S.D.
J. Ben Russell No. 1 fee, SE SE NW SE sec. 9-2s-3e. Drlg. 2,085 ft.

Stephens County

Wm. Angle No. 1 Lang, SW SW NE sec. 24-1n-7w. T.D. 3,525 ft.; to deepen.
Carter Oil Co. No. 1 Harley, C NE NE sec. 24-2s-4w. Viola 5,152 ft.; drlg. 5,285 ft.
H. J. Edwards No. 1 Frederick, SW cor NE SE NW sec. 31-2n-8w. T.D. 2,754 ft.; S.D.
Helmerich & Payne No. 1 Graham, SW SW NE sec. 12-1n-5w. T.D. 5,014 ft.; mudded in gas; S.D.
Charles Newsom No. 1 Pfile, SW cor. sec. 1-2s-7w. Set 10-in. csg. 115 ft.; T.D.
Geo. L. Pace et al No. 1 Tah-Su-Dah, SE NW SW sec. 27-1s-9w. T.D. 2,707 ft.; Schlumberger test; wtr.; S.D.O.

Tillman County

Cavens et al No. 1 Southerland, SW SW NW sec. 35-4s-16w. R.U.R.
Magnolia Pet. Co. No. 1 Brown, SW SE NE sec. 21-3s-18w. Drlg. 5,339 ft.

OKLAHOMA

Week Ending May 22

NORTHERN OKLAHOMA

Alfalfa County

Olson Drlg. Co. et al No. 1 Acre, C SW NE sec. 14-24-11w. O.W.P.B.; C.O. at 5,930 ft.

Beckham County

Carter Oil Co. No. 1 Bingham, NE cor. sec. 31-8-26w. Drlg. 1,469 ft.
Carter Oil Co. No. 1 Porter, C SW SW sec. 36-10-25w. Drlg. 3,350 ft.
Mid-American Oil Co. No. 1-A Biscoe, SW cor. sec. 28-8-22w. Drlg. 1,945 ft.

Caddo County

Clyde Becker et al No. 1 Pharris, SE SE NW sec. 24-6-12w. Set 15½-in. csg. 208 ft.; W.O.C.

Cleveland County

W. R. Hollenbeck No. 1 Norman, NW NW NE sec. 17-9-2w. T.D. 6,195 ft.; S.D. for wtr.

Creek County

M. W. Mosier et al No. 1 Holcomb, SE SW NW sec. 19-18-8. T.D. 2,935 ft.; drlg. on iron.

Garfield County

Ohio Oil Co. No. 1 State, SW cor. sec. 13-23-3w. Viola 4,577 ft.; Dol. 4,615 ft.; first Wilcox 4,629 ft.; drlg. 4,746 ft.

Greer County

Nelf-Godfrey-Andrea No. 1 Melton, SE NW SE sec. 16-22w. Drlg. 3,758 ft.

Haskell County

Continental Oil Co. No. 1 Ferguson, SW SE NE sec. 33-8-20. Drlg. 3,478 ft.

Harmon County

Penn State Oil Co. No. 1 Cole, C W½ SW NW sec. 21-2n-26w. T.D. 5,575 ft.; S.D.O.

Hughes County

C. E. Beal No. 1 Eason, NE NE NW sec. 7-9-11. Set 12½-in. 397 ft.; W.O.C.
Cap Rock Oil Co. No. 1 Parks, SW SW SE sec. 34-7-8. Drlg. 3,905 ft.
E. H. Moore, Inc., No. 1 Buck, NW SW SW sec. 21-8-10. Drlg. 1,700 ft.

Kay County

Higdon et al No. 1 Nieman, NE NW NE sec. 9-26-3e. T.D. 519 ft.; fsg.

Kiowa County

Argus Pet. Co. No. 1 Osborne, NW cor. NE sec. 9-7-16w. T.D. 1,275 ft.; acd.; rng. tbg.
Kiowa Oil Corp. No. 1 Finder, C SW NE sec. 4-6-20w. T.D. 130 ft.; S.D.

Latimer County

Clark Drlg. Co. et al No. 1 Wilson, C SE SE sec. 15-5-18. Drlg. 5,112 ft.

Lincoln County

Exchange Drlg. Co. No. 1 Dowell, SE SE NW sec. 10-14-6. Prue 3,006-57 ft.; good S.O.; T.D. 3,065 ft.; to shoot.

Logan County

Anthony & Marshall No. 1 Fruin-Eckman, SE SE SW sec. 4-16-1e. T.D. 4,975 ft.; wating on new cable.
Eason Oil Co. et al No. 1 Sisters, SW cor. sec. 24-17-1w. First Wilcox 5,402 ft.; drlg. 5,423 ft.
Helmerich & Payne et al No. 1 Randall, SW SW NW sec. 24-16-1w. Layton 3,572-3,640 ft.; drlg. 4,297 ft.

Noble County

Lincoln Oil Co. et al No. 1-A Nell, NE cor. sec. 15-23-2w. Wilcox 4,681 ft.; T.D. 4,826 ft.; fsg.
Magnolia Pet. Co. No. 1 Forsythe, SE SE SW sec. 23-21-2w. Oswego 4,510 ft.; Prue 4,820 ft.; Big lime 4,410 ft.; drlg. 4,918 ft.
Stanolind O. & G. Co. and Amerada Pet. Corp. No. 1 Johnson, NW NW SE sec. 4-20-2w. R.U.R.
Summit Drlg. Co. et al No. 1 Dolezal, SE SE SW sec. 8-22-1w. Oswego 4,315 ft.; drlg. 4,505 ft.

Oklahoma County

Sunray Oil Co. No. 1 Dickson, NW cor. sec. 17-11-1e. M.I.T.

Osage County

Helmerich & Payne et al No. 1 Osage, NE NE SW sec. 13-23-6. Drlg. 2,045 ft.
Midco Oil Corp. No. 1 Osage, SE SE NW sec. 22-23-6e. Drlg. 945 ft.

Pawnee County

Carter Oil Co. No. 1 Wells, C E½ SE NW sec. 30-23-5. Rig.

Payne County

Bill Riddle No. 1 Van Zandt, NW NW SE sec 16-18-3e. Drlg. 2,300 ft.

LOUISIANA

NORTH LOUISIANA PROVEN

Caddo—Rodessa

Drillers, Inc., No. 1 Glasselll-Means, SW NE SE sec. 9-23-15. Cg. 6,003 ft.
J. E. Jones No. 1-A Parker, SW cor. sec. 4-23-16. Drlg.
R. W. Norton No. 3 L. C. Harden, SW sec. 17-23-16. 6-in. cmtd. 5,875 ft.; T.D. 5,956 ft.; W.O.C.S.
R. W. Norton No. 1 Payne, C SE SE sec. 27-23-16. Drlg. 9,651 ft.
R. W. Norton No. 5 Starke, SW sec. 17-23-16. Drlg. 3,734 ft.
R. W. Norton No. 6 Starke, NE sec. 17-23-16. Drlg.
Standard Oil of La. No. 3 Armistead Comm., SE SE SE sec. 4-23-16. Drlg. 4,714 ft.
Standard Oil Co. No. 2 L. J. Kaempfer, NE NW SW sec. 9-23-16. Drlg. 5,000 ft.
Standard Oil Co. No. 2 Sarah Kaempfer, SW SW NE sec. 9-23-16. Drlg. 3,881 ft.
Standard Oil Co. No. 3 Sarah Kaempfer, NW NW SE sec. 9-23-16. Drlg. 3,010 ft.
Surf Oil Co. No. 1 Allison, NE sec. 8-23-16. R.U.
Surf Oil Co. No. 1 Upchurch, NE sec. 8-23-16. Drlg.
United Gas No. 6 fee 574, SW NE NW sec. 16-23-16. 7-in. 5,986 ft.; T.D. 5,992 ft.; W.O.C.S.
United Gas No. 7 fee 574, SW NW sec. 16-23-16. Drlg.
United Gas No. 8 fee 574, NW cor. sec. 16-23-16. Loc.
United Gas No. 9 Bremer Unit, SW sec. 22-23-16. Comp.; flw. 8 B.P.H.; T.D. 6,014 ft.
United Gas No. 11 Pitts Unit, SE NW sec. 13-23-16. Drlg. 3,137 ft.
United Gas No. 2 Starke, C SW SW sec. 9-23-16. Loc.
United Gas No. 5 Young, NW sec. 27-23-16. T.D. 6,790 ft.; hole clean; W.O.

N. LOUISIANA WILDCATS

Bienville Parish

DeSota O. & G. Co. No. 1 Ashley, SW SE sec. 15-16-10w. Drlg. 2,100 ft.
Hunt Oil Co. et al No. 1 Bodcaw, SE sec. 30-14-5w. M.I.R.
Lide & Greer No. 1 W. J. Smelley, SE NW SW sec. 18-16-4w. T.D. 6,800 ft.; fsg. for cone.

Bossier Parish

Arkansas-La. No. 2-B Werner, NE cor. sec. 7-17-11. Drlg. 2,015 ft.
Ray P. Overless et al No. 1 Birenhern, NW NW NE sec. 23-21-14. S.D. 98 ft.
Triangle Drlg. Co. No. 1-C Howell, NW sec. 26-17-12. Drlg.
Premier Inv. Co. No. 40 Wyche, SE NW NW sec. 14-19-9. Comp.; pmp. 5 B.P.D.; T.D. 410 ft.
Premier Inv. Co. No. 41 Wyche, SE NW NW sec. 14-19-11. Drlg. 200 ft.
Producers O. & G. Co. No. 1 Hill Est., E½ NE¼ sec. 8-17-11. 10-in. 509 ft.
Producers O. & G. No. 1 R. Johnson, NE sec. 5-17-11. Drlg. 3,320 ft.
Tidwell et al No. 1 Natting, sec. 15-22-14. T.D. 2,954 ft.; S.W.; abd.
Triangle No. 2 Ross Unit, NW SW NW sec. 23-17-12. T.D. 5,180 ft.; flw. 115 bbls. in 16 hrs.
Triangle Drlg. Co. No. 2-A State, SW cor. sec. 23-17-12. Comp.; flw. 125 B.P.D.; T.D. 5,170 ft.
United Gas No. 1 S. L. Herold, 660 ft. S and W. NE sec. 31-17-4. Drlg. 300 ft.
United Gas No. 1-A Jeter Unit, SW sec. 24-17-12. Drlg. 2,700 ft.
United Gas No. 3 L. Schmitt, NW sec. 14-17-12. M.I.M.
United Gas No. 2-I H. C. Skannal, SW sec. 25-17-12. 9-in. cmtd. 2,607 ft.; W.O.C.S.

Caddo Parish

J. G. Abney No. 1 Thigpen & Herold, NW SW sec. 15-21-15. T.D. 993 ft.; 7-in. cmtd. 986 ft.
W. D. Ambrose No. 1 Pender, NW NE SW sec. 11-20-15. R.U.
Calatex O. & G. No. 3-A Agurs, SW cor. sec. 6-16-6. Drlg. 2,080 ft.
Chew & Chew No. 1 Standard Oil, SE sec. 32-21-16. R.U.
W. D. Chew No. 4 U. S. Govt. O.W.D.D.; T.D. 1,859 ft.; pmpd. 15 B.P.D.; comp.
Paul Cooper No. 2 Rodgers, NW SW SW sec. 11-20-15. 6-in. 2,185 ft.; T.D. 2,204 ft.
T. B. Donnell No. 4 Stokeley, SW sec. 5-20-16. Drlg. 625 ft.

LEGAL

Department of the Interior, U. S. Land Office, Las Cruces, New Mexico. Notice is hereby given that the W½ NW¼ Sec. 17, and the E½ NE¼ Sec. 18, T. 17S., R. 31E. N. M. P. M., containing 160 acres, in the Jackson producing oil and gas field, are offered in a single unit to the qualified bidder of the highest amount offered per acre, the minimum bid being $25 per acre, as a bonus for the privilege of leasing the land under section 17 of the mineral leasing act of August 21, 1935 (49 Stat. 674), at the sliding royalty rate scale in the standard lease form on page 6 of Circular 1386, at the sale to be held in the United States Land Office at Las Cruces, New Mexico, at 10 o'clock A. M., on June 25, 1937. The successful bidder must deposit on the date of the sale with the officer in charge of the sale, a certified check on a solvent bank or cash, for one-fifth of the amount bid by him, and file the showing of qualifications to receive a lease required by section 7 of said Circular 1386. Bidders are warned against violations of the provisions of section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Register.

T. B. Donnell No. 5 Stokeley, SW sec. 5-20-16. Loc.
G.R.C. Oil Co. No. 5 Herndon, NE SE NW sec. 22-21-15. Comp.; pmp. 40 B.P. D.; T.D. 1,600 ft.
W. J. Hunter et al No. 1 Stoer, NW SW NE sec. 10-15-15. Cg. 5,200 ft.
F. L. Luckett No. 1 Connell, SW NE sec. 10-20-15. 6-in. cmtd. 2,174 ft.; T.D. 2,203 ft.; prep. to test.
Tom Pappas No. 2 Spell, SW sec. 28-21-15. Drlg. 625 ft.
W. L. Porter No. 1 Terbune, sec. 15-21-16. T.D. 980 ft.; prep. D.D.
Prairie River Synd. No. 1 Hutchinson, SW NW sec. 15-15-12. 7-in. cmtd. 7,730 ft.; T.D. 7,757 ft.
Rodgers et al No. 1 Thompson, NW SW SW sec. 11-20-15. Comp.; pmp. 5 B.P.D.; T.D. 2,204 ft.
Shreveport Oil Corp. No. 2-D Munslow, SE sec. 5-20-15. Drlg. 2,204 ft.
Simplex Oil No. 5-A Natalee, NE NW SE sec. 10-20-15. 7-in. cmtd. 2,180 ft.; T.D. 2,201 ft.
Stanolind O. & G. No. 122 Dillon, sec. 13-21-15. Comp.; 60 B.P.D.; T.D. 1,665 ft.
Stanolind No. 1 Wheritt, SE SW sec. 23-21-15. Drlg. 1,420 ft.
Stewart Williams No. 2 Connell, SW NE sec. 10-20-15. 10-in. 80 ft.

Claiborne Parish

Atlantic Ref. Co. et al No. 1 F. B. King, SE sec. 35-21-5. Drlg. 100 ft.
J. B. Bond No. 1 H. E. Patton, E½ NW NW sec. 36-21-5. 7-in. cmtd. 5,264 ft.; T.D. 5,290 ft.; W.O.C.S.
Gulf Ref. Co. No. 2 Eva Bennett, sec. 31-21-4. Drlg. 3,000 ft.
Gulf No. 1 Henry, S½ NW NE sec. 31-21-4. Drlg. 753 ft.
Hollifield & McFarland No. 1 M. Patton, N½ NW SE sec. 31-21-4. 10-in. cmtd. 906 ft.
Love Pet. Co. No. 2 H. E. Patton, W½ SW SE sec. 36-21-5. Drlg. 3,690 ft.
Lyons & Neely No. 2 H. E. Patton. W½ NW SW sec. 36-21-5. Drlg. 3,280 ft.
Lyons & Neely No. 1-B Maggie Patton, W½ SE SW sec. 31-21-4. Drlg. 2,053 ft.
Lyons & Neely No. 2-B Maggie Patton, E½ SE SW sec. 31-21-4. R.U.
Lyons & Neely No. 2 Maggie Patton, E¼ NW SW sec. 31-24-4. Drlg. 4,309 ft.
Magnolia Pet. No. 1 English, S½ SE SW sec. 31-21-4. Drlg. 1,998 ft.
Magnolia Pet. Co. No. 2 English, S½ SW NE sec. 31-21-4. Loc.
Magnolia Pet. No. 1 H. E. Patton, NW SE SW sec. 36-21-5. Drlg. 4,700 ft.
L. O. McMillan No. 1-B Maggie Patton, sec. 31-21-4. 7-in. cmtd. 5,301 ft.; T.D.; W.O.C.S.
L. O. McMillan et al No. 2 H. E. Patton, W½ SW NW sec. 36-21-5. Drlg. 1,500 ft.
L. O. McMillan et al No. 2-A H. E. Patton, N½ NE SW sec. 31-21-4. Drlg. 4,101 ft.
McMillian et al No. 2 Roberta Vaughn, N½ NW NE sec. 36-21-5. Drk.
Ray P. Oden No. 2 H. W. Patton, NW SE SE sec. 36-21-5. Comp.; flwg. 834 B.P. D.; T.D. 5,352 ft.
C. R. Schuster No. 1 M. S. Patton, NE NW NE sec. 1-20-5. Drk.
C. R. Schuster et al No. 2 M. S. Patton, S½ NW NE sec. 1-20-5. R.U.
Scouts Oil Co. No. 1 R. Vaughn, E½ NE NW sec. 36-21-5. R.U.
Scouts Oil Co. No. 2 R. Vaughn, W½ NE NW sec. 36-21-5. M.I.M.
Shreveport Oil Corp. No. 1 Edwards, NE sec. 16-20-5w. Drlg. 2,250 ft.
Standard Oil of La. No. 1 Baker, 660 S&E NW sec. 27-19n-7w. T.D. 7,247 ft.; D.& A.
Standard Oil No. 1 F. B. King, 660 ft. N, 330 ft. W, SE SE NE sec. 35-21-5. 9-in. cmtd. 867 ft.
J. C. Tippett No. 1 H. E. Patton, 330 ft. N and E, SW SE sec. 36-21-5. 7-in. 5,279 ft.; T.D. 5,313 ft.; W.O.C.S.
J. C. Tippett No. 2 H. E. Patton, sec. 36-21-5. Drk.
P. W. Woodruff No. 1-B McDonald, N½ SE NE sec. 36-21-5. Drlg. 4,359 ft.
P. W. Woodruff No. 1 T. E. Patton, S½ SE NE sec. 36-21-5. Drlg. 4,176 ft.

De Soto Parish

Benedum & Trees No. 1 Clifton, NE NW sec. 33-13-12. T.D. 5,696 ft.; D.&A.
Chamberlin et al No. 1 Lainer, SW NE sec. 29-11-11. Cg 2,800 ft.
Grogan Oil No. 1-A Ramsey, sec. 36-11-11. Drk.
Rio Rajo Oil Co. No. 7 Prudhomme, SE cor. sec. 20-12-11. T.D. 2,749 ft.; W.O. S.R.
Stillers et al No. 2 Jenkins, 330 ft. S and W, NE SE NW sec. 35-13-12. T.D. 2,503 ft.; abd.; dry.

Franklin Parish

Jensen & Bailey No. 1 Grayson, C NE sec. 36-12-6e. 10-in. cmtd. 220 ft.

Grant Parish

Burkett et al No. 1 Morrison, 156 ft. E and W, NW SW SW sec. 10-9-1e. Drlg. 1,080 ft.
R. W. Fair No. 1 R. L. Gray, NW cor. 180-ac. tr. 10-in. cmtd. 320 ft.
H. M. S. Corp. No. 1 McNeely, sec. 21-6n-3w. 20-in. csg. 20 ft.
Harvey Weir No. 1 Calfax Bk. & Tr. Co., NE NW sec. 15-7n-3w. 10-in. cmtd. 160 ft.; W.O.C.S.

LaSalle Parish

Montgomery No. 1 Tullos, SW SE sec. 23-10-1e. Drk.
Old Homestead O. & G. Co. No. 1 Zenoria, sec. 23-9-1. T.D. 1,650 ft.; D.&A.

Lincoln Parish

J. D. Carruthers No. 1 Aycock, N½ SW SW sec. 6-20-4. Drk.
B. O. D. C. and H. D. Easton No. 1 G. W. Dye, NE NE sec. 21-19-4w. M.I.M.
Glassell & Glassell No. 1 Gray, SE sec. 16-20-3e. Drlg. 4,150 ft.
Lyons & Neely No. 1 W. H. Patton, N¼ NW NW sec. 6-20-4. 5-in. cmtd. 5,314 ft.; T.D. 5,341 ft.
E. T. Oakes-H. D. Easton and Evans No. 1 R. L. Sanderson, NW SE NW sec. 36-18-1w. Drk.

Morehouse Parish

J. E. Ferrell No. 1, NE sec. 27-20-4e. Loc.
So. Carbon Co. No. 3 Miles, NE sec. 36-21-4e. Comp.; gauge 2,000,000 ft. gas; 710 lbs. R.P.; T.D. 2,227 ft.
United No. 48 Crossett, SE sec. 36-22-4. Drk.
United No. 49 Crossett, NE sec. 24-22-4e. Drk.
United Gas No. 1, NE sec. 36-22-4e. Drk.

Ouachita Parish

Hope Prod. Co. No. 8 Cole, sec. 38-19-3e. Loc.
Hope Prod. Co. No. 9 Cole, sec. 38-19-3e. Loc.
J & H Oil Co. No. 1-A Frost Lbr. Co., NW sec. 36-19-3e. Loc.
J & H Oil Co. No. 2-A Frost Lbr. Co., SW NW sec. 36-19-3e. Loc.

Red River Parish

F. G. Gellz No. 1 Teekell, SW SE sec. 34-13-10. T.D. 1,027 ft.; acidizing.
Gulf No. 27 Kennedy, SW sec. 24-13-11. T.D. 2,553 ft.; W.O.S.R.
Gulf Prod. Co. No. 41 E. T. Robinson, NW sec. 25-13-11. Drlg. 1,270 ft.
Peria Oil Co. No. 1 DeLong, 330 ft. S and E, C sec. 23-12-10. 7-in. cmtd. 1,023 ft.; S.O.; T.D. 1,039 ft.
J. D. Wadley No. 1 McClelland, SE NE sec. 24-13-11. Drlg. 3,250 ft.

Sabine Parish

Odell Henson No. 11 Long Bell, SE NE NW sec. 5-8-13. S.D. 40 ft.
Kirk-Green-Way Inc. No. 1 Whitney Corp., NW NE sec. 8-9-13. Drlg. 5,588 ft.
Peria Oil Co. No. 1 Brown, SE SW NW sec. 16-9-13. 10-in. cmtd. 54 ft.
Producers O. & G. Co. No. 5 Edwards Est., SW NW SW sec. 29-9-13. Drlg. 1,760 ft.
Prod. O. & G. Co. No. 1 Lynch, SW NE SW sec 29-9-13. Pumped off; acid; T.D. 1,608 ft.
Ray Drig. Co. No. 3 Burkett, NW SW sec. 10-9-13. T.D. 1,252 ft.; W.O.S.R.
A. C. Scott No. 1 Bowman-Hicks Lbr. Co., sec. 23-9-13. S.S.O.; tstg.; T.D. 3,070 ft.
Willis & Dowden No. 1 Lynch, SW NE SW sec. 29-9-13. T.D. 1,608 ft.; arg. tst.
Windsor No. 1 H. Brown, NW SW NW sec. 16-9-13. Drk.
Windsor No. 1 M. Elliott, SE NE NW sec. 17-9-13. R.U.

Tensas Parish

H. M. Jones et al No. 1 Chicago Mill & Lbr. Co., NE sec. 30-12n-10e. T.D. 798 ft.; blew out after stng. 8 mo.; gauging 30,000,000 ft. gas and 10,000 bbls. wtr.; drld. out bridge and well blew out again and bridged over; T.D. 798 ft.; W.O.; T.D. 798 ft.; blew out again and bridged.

Union Parish

Interstate Fee No. 64, NW sec. 29-21-4e. Loc.
Interstate Gas Co. No. 68 fee, SW sec. 29-21-4e. Loc.
Interstate Gas Co. No. 90 fee, SE sec. 30-21-4e. Loc.
W. L. Wood No. 1-B Frost Lbr. Co., sec. 9-21-3e. Comp.; gauge 2,000,000 ft. gas; 875 lbs. R.P.; T.D. 2,192 ft.

Webster Parish

W. H. Bass Drlg. Co. No. 1 T. Crichton, C NW NW sec. 21-20-9. Drlg. 6,347 ft.
N. V. Duncan No. 1 G. T. Baker, sec. 9-23-9. T.D. 2,797 ft.: tstg.
Magnolia No. 2 D. G. Cox, SW SE NE sec. 22-21-10. Drlg. 6,242 ft.
Magnolia Pet. Co. No. 2 G. W. Cole, NE NW NE sec. 27-21-10. 13-in. cmtd. 847 ft.
Magnolia Pet. No. 6 Ira Cox, NE NE SE sec. 23-21-10. Drlg. 2,810 ft.
Magnolia Pet. Co. No. 2 A. J. McCook, SW sec. 22-21-10. Drk.
Ohio Oil Co. No. 1 S. P. D. Covle, NW SE SW sec. 23-21-10. Drlg. 7,636 ft.
Ohio Oil Co. No 2 R. M. Coyle, SE sec. 22-21-10. Drlg. 7,355 ft.
Ohio No. 1 S. P. D. Coyle and W. Cox, SW SW SE sec. 23-21-10. Drk.
Ohio Oil No. 1 T. Crichton, Acct. No. 2, SE NE sec. 21-21-10. Drk.
Ohio Oil No. 1 L. M. Gardner, NE sec. 22-21-10. Drlg. 5,481 ft.
Ohio Oil Co. No. 2 A. H. Gray Acct. No. 2, NW sec. 26-21-10. Cg. 8,320 ft.
Ohio Oil Co. No. 2 A. J. Hodges, NE NW SW sec. 23-21-10. Drlg. 8,263 ft.
Ohio No. 7-B R. L. Holloway, 586 ft. N, 756 ft. E line, sec. 23-21-10. Drk.
L. R. Skidmore No. 1 Barnett, NE NW SW sec. 29-17-9. T.D. 3,785 ft.; S.D.
Standard Oil of La. No. 1 E. L. Stewart, SE SE SE sec. 32-21-10. Drlg. 5,136 ft.
Woodley Pet. Co. No. 4-B Gray, NE NE sec. 27-21-10. Cg. 8,332 ft.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co. No. 1 Brookshire, sec. 66-12s-3e. M.I.M.

Bayou Blue—Iberville Parish

Humble O. & R. Co. No. 3 Wilbert sec. 74-9s-10e. Drk.

Bay St. Elaine—Terrebonne Parish

F. J. LeBlane et al No. 1 Wurzlow, sec. 17-22s-18e. Spdd.
Texas Co. No. 14 State, sec. 20-22s-18e. Drlg. sh. and L. 4,515 ft.

Bayou Cocotrix—Terrebonne Parish

Shell Pet. Corp. No. 1 Pelican, sec. 35-17s-15e. Cg. sh. 9,207 ft.
Shell Pet. Corp. No. 2-B Realty Operators, sec. 18-17s-15e. Bldg. drk.

Black Bayou—Cameron Parish

Shell Pet. Corp. No. 37 Watkins, sec. 8-12s-12w. T.D. 4,648 ft.; salt; P.B. 3,588 ft.; sdtrkd.; drlg. 3,924 ft.

Caillou Island—Terrebonne Parish

Texas Co. No. 1 Caillou Island, sec. 18-23s-20e. Loc.
Texas Co. No. 1 L.L.&E., sec. 18-23s-20e. Drk.
Texas Co. No. 3 State, sec. 19-23s-20e. T.D. 6,694 ft.; 7⅝-in. csg. 6,648 ft.; perf. csg. 6,620-40 ft.; I.P. 513 B.P.D.; ⅛-in. ck.
Texas Co. No. 41 State, sec. 17-23s-20e. Cg. oil sd. 4,486 ft.

Charenton—St. Mary Parish

Pan American Prod. Co. No. 3 Laws Realty Co., sec. 25-12s-9e. T.D. 8,853 ft.; run Schlumberger.
Pan American Ref. Co. No. 4 Laws Realty Co., sec. 30-13s-10e. Drk.
Pan American Prod. Co. No. 1 South Coast Corp., sec. 30-13s-10e. T.D. 7,923 ft.; rec. 1,000 ft. of P.L.O. on D.S.T. 7,906-23 ft.; 7-in. csg. 7,906 ft.; flwd. est. 600 bbls. of fluid per day 50% S.W.; will W.O.
Pan American Prod. Co. No. 1 Veeder, sec. 30-13s-10e. Drk.

Cameron Meadows—Cameron Parish

Burton-Sutton Oil Co. No. 16 Sch. Ld., sec. 16-14s-13w. Drk.
Burton Sutton Oil Co. No. 18 School Ld., sec. 16-14-13w. T.D. 3.650 ft.: 7-in. csg. 3,632 ft.; I.P. 450 B.P.D.; ¼-in. ck.
Magnolia Pet. Co. No. 19 Cameron Meadows, sec. 16-14s-13w. S.D. 5,834 ft.

Darrow—Ascension Parish

Humble O. & R. Co. No. 1 V. E. Landry, sec. 34-10s-2e. Drlg. sdy. sh.
Kira Oil Co. No. 1 Duplessis, sec. 69-10s-2w. R.U.

Dog Lake—Terrebonne Parish

Texas Co. No. 5 State, sec. 5-22s-16e. 10¾-in. csg. 1,505 ft.; drlg. sh. 6,617 ft.; corrected.

Fausse Point—Iberia Parish

Texas Co. No. 3 State, sec. 35-11s-8e. R.U.

Garden Island—Plaquemines Parish

Texas Co. No. 21 State, sec. 37-23s-33e. Drlg. sh. 4,909 ft.

Gillis—Calcasieu Parish

Fohs Oil Co. No. 3 Airhart, sec. 14-9s-8w T.A.; loc.
Fohs Oil Co. No. 18 Castle, sec. 34-10s-12w. Drk.
Union Sulphur Co. No. 14 Barbe, sec. 1-9s-8w. T.D. 6,738 ft.; 7-in. csg. 6,723 ft.; S.D.
Union Sulphur Co. No. 15 Barbe, sec. 1-9s-8w. T.D. 6,730 ft.; P.B. 3,930 ft.
Union Sulphur Co. No. 7 Castle, sec. 14-9s-8w. Drlg. sd. and sh. 6,796 ft.
Union Sulphur Co. No. 5 Kaufman, sec. 13-7s-8w. Drk.
Union Sulphur Co. No. 6 Mayo-Reeves, sec. 12-9s-8w. Drlg. sh. 3,585 ft.

Hackberry—Cameron Parish

Burton-Sutton Oil Co. No. 1-A Duhon, sec. 22-12s-10w. T.D. 4,879 ft.; 7-in. csg. 4,845 ft.; I.P. 482 B.P.D.; ¼-in. ck.
W. T. Burton No. 2 R. Vincent, sec. 22-12s-10w. Drlg. sh. 1,936 ft.
W. T. Burton No. 1 J. J. Roboria, sec. 11-9s-2w. R.U.
Emanon Oil Co. No. 1 Porter Ellender, sec. 21-12s-10w. Drlg. sdy. sh. 1,316 ft.
Stanolind O. & G. Co. No. 1-B Duhon, sec. 27-12s-10w. Drlg. sh. 1,193 ft.
Stanolind O. & G. Co. No. 4 Duhon, sec. 22-12s-10w. Drk.
Stanolind O. & G. Co. No. 25-B Gulf Land fee, sec. 15-12s-10w. 20-in. csg. 158 ft.; drlg. sh. and L. 6,595 ft.
Stanolind O. & G. Co. No. 1 Little, sec. 28-12s-10w. Run 109 ft. 16-in. csg.; drlg. sh. 4,634 ft.
Stanolind O. & G. Co. No. 19 School Ld., sec. 16-12s-10w. R.U.
Stanolind O. & G. Co. No. 53 State, sec. 16-12s-10w. Drk.
Texas Co. No. 21 State, sec. 12-12s-9w. 10¾-in. csg. 2,126 ft.; T.D. 7,630 ft.; 7-in. csg. 7,600 ft.; I.P. 650 B.P.D.; 14/64-in. ck.

Iowa—Jefferson Davis Parish

Shell Pet. Corp. No. 24 Heyd, sec. 13-9s-7w. Drlg. sh. 1,225 ft.

Jeanerette—St. Mary Parish

Herton Oil Co. No. 1 Banta, sec. 40-13s-9e. 9⅝-in. csg. 7,030 ft.; drlg. sh. 8,307 ft.
Herton Oil Co. No. 8 Banta, sec. 40-13s-9e. T.D. 6,650 ft.; 7-in. csg. 6,637 ft.; I.P. 869 B.P.D.; ¼-in. ck.
Herton Oil Co. No. 6 Carter, sec. 38-13s-9e. Oil sd. 7,031-41 ft.; 7-in. csg. 7,006 ft.; I.P. 769 B.P.D.; ¼-in. ck.
Herton Oil Co. No. 7 Carter, sec. 38-13s-9e. Drk.
Herton Oil Co. No. 2 Roanes, sec. 40-13s-9e. Drk.

Jennings—Acadia Parish

W. T. Burton No. 1 Robira, sec. 41-9s-2w. Cd. oil sd. 6,700-6,800 ft.; cg. ahead.
Alfred Glassell No. 1 R. McFarlan, sec. 41-9s-2w. Drlg. sh. 4,394 ft.
Alfred Glassell No. 1 Troushelle, sec. 42-9s-2w. Drlg. sh. and L. 5,852 ft.
Stanolind O. & G. Co. No. 18 Houssiere-Latrielle, sec. 47-9s-2w. 8⅝-in. csg. 5 358 ft.; T.D. 7,072 ft.; 6⅝-in. csg. 7,005 ft.; making 2½ bbls. of distillate per day; killed to W.O.; cutting and pulling screen.
Superior Oil Prod. Co. No. 2 Iowa-Jennings, sec. 41. Drlg. sh. 3,250 ft.
Superior Oil Prod. Co. No. 3 Jennings, sec. 42-9s-2w. Drlg. sh. 5,752 ft.; (corrected).
Superior Oil Prod. Co. No. 3 Wm. Lecklet. Drlg. sdy. sh. 6,340 ft.
Superior Oil Prod. Co. No. 4 Lecklet, sec. 42-9s-2w. Drlg. sd. 4,783 ft.
Superior Oil Co. No. 5 W. M. Lecklet, sec. 42-9s-2w. Drk.

Lafitte—Jefferson Parish

Texas Co. No. 2 Milling, sec. 20-17s-24e. Dredging canal.
Texas Co. No. 7 Rigolet, sec. 29-17s-24e. T.D. 9,368 ft.; oil sd.; make D.S.T.
Texas Co. No. 1 State-Bayou Norman, sec. 28-17s-24e. Drlg. sdy. sh. 9,387 ft.

Lake Pelto—Terrebonne Parish

Texas Co. No. 15 State, sec. 17-23s-18e. T.D. 7,136 ft.; 7⅝-in. csg. 6,160 ft.; showed gas pres. and oily mud on D.S.T.

Lake Hermitage—Plaquemines Parish

Gulf Ref. Co. No. 7 Lafourche, sec. 12-18s-25e. R.U.

Leesville—Lafourche Parish

Gulf Ref. Co. No. 2 Allen Land Co., sec. 26-21s-22e. T.D. 1,048 ft.; fsg.
Gulf Oil Corp. No. 1-A City of New Orleans, sec. 35-21s-22e. T.D. 6,349 ft.; abd. 22e. Drlg. sdy. sh. 3,838 ft.
Gulf Ref. Co. No. 64 Leesville, sec. 26-21s-10s-9w. T.D. 6,485 ft.; fsg.
Texas Co. No. 65 Leesville, sec. 27-21s-22e. Drlg. sh. 105 ft.

Lockport—Cameron Parish

Magnolia Pet. Co. No. 6 Freeburg, sec. 9-10s-9w. T.D. 6,485 ft.

New Iberia—Iberia Parish

Wm. Hellis No. 8 Bernard, sec. 54-12s-7e. Drlg. sh. and L. 4,909 ft.
Wm. Hellis No. 3 Schwing, sec. 57-12s-7e. S.D. 4,962 ft.; salt; P.B. and sdtrkd.; drlg. sh. 3,099 ft.
Texas Co. No. 3 Bryant, sec. 25-12s-7e. R.U.
Wm. Hellis No. 5 Bullock-Burke, sec. 52-12s-7e. Drlg. 1,213 ft.
Texas Co. No. 3 Duhe, sec. 26-12s-7e. Drk.
Texas Co. No. 6-B Hanzen, sec. 54-12s-7e. Spudded.

Port Barre—St. Landry Parish

Pan American Prod. Co. No. 2 Watkins, sec. 4-6s-5e. Straightening hole 5,300 ft.

Roanoke—Jefferson Davis Parish

Humble O. & R. Co. No. 6 Kratzer, sec. 11-9s-4w. Drlg. sd. 5,380 ft.

Sorrento—Ascension Parish

Sorrento Oil Co. No. 1 Bernard, sec. 9-19s-14e. T.D. 6.708 ft.; P.B. 5,373 ft.; drlg. sd. 5,760 ft.

South Roanoke—Jeff Davis Parish

Union Sulphur Co. et al No. 1 T.R.S. Farms Co., sec. 23-10s-4w. M.I.R.

South Jennings—Jeff Davis Parish

Stanolind-Amerada Pet. Corp. No. 2 Calcasieu Natl. Bank, sec. 10-10s-3w. 13⅜-in. csg. 1,987 ft.; drlg. sd. and sh. 7,190 ft.

Starks—Calcasieu Parish

J. R. Turnbull No. 1 Industrial Lbr. Co. sec. 20-9s-12w. S.D. 6,433 ft.

St. Martinsville—St. Martin Parish

Tide Water Oil Co. No. 1-C Smedes, sec. 57-11s-6e. Drlg. sh. 7,436 ft.
Tide Water Oil Co. No. 4 Smedes, sec. 57-11s-6e. Drk.

Tepetate—Acadia Parish

Continental Oil Co. No. 1 Guilery, sec. 34-7s-2w. Drk.
Continental Oil Co. No. 2 Macabees, sec. 22-7s-2w. Drk.
Continental Oil Co. No. 4 P. W. Miller, sec. 28-7s-2w. T.D. 8,316 ft.; I.P. 285 B. P.D.; 5/32-in. ck.
Continental Oil Co. No. 1 Vincent and Welch, sec. 30-7s-2w. Drlg. sh. 6,912 ft.
Continental Oil Co. No. 8-A Welch, sec. 28-7s-2w. T.D. 8,306 ft.; 5¾-in. csg. 8,306 ft.; W.O.C.

Valentine—Lafourche Parish

Pan American Prod. Co. No. 3 Harang, sec. 8-17s-20e. T.D. 7,718 ft.; D.P. stuck. P.B. 5,154 ft.; drlg. sh. 6,773 ft.
Pan American Prod. Co. No. 4 Harang, sec. 8-17s-20e. T.D. 7,190 ft.; 7-in. csg 7,120 ft.; made squeeze job 5,395-5,450 ft.; perf. csg. 5,405-32 ft.; I.P. 26 B.P.H.; ⅛-in. ck.
Pan American Prod. Co. No. 5 Harang, sec. 8-17s-20e. 16-in. csg. 235 ft.; drlg. sh. 6,845 ft.
Pan American Prod. Co. No. 6 Harang, sec. 8-17s-20e. Drk.

Vinton—Calcasieu Parish

Woodley Pet. Co. No. 1 Gray, sec. 32-10s-12e. T.D. 3,734 ft.; 7-in. csg. 3,600 ft.; I.P. 12 B.P.H.; ¼-in. ck.

White Castle—Calcasieu Parish

Shell Pet. Corp. No. 4 Shingle, sec. 12-11s-12e. T.D. 8,903 ft.; P.B. 8,717 ft.; milling out of csg. at 8,027 ft.; drlg. sh. 8,337 ft.

S. LOUISIANA WILDCATS

Acadia Parish

H. E. Dalton No. 1 Setting, sec. 17-7s-1w. T.D. 5,426 ft.; left 900 ft. of D.S. in hole.
Humble O. & R. Co. No. 1 Floyd Williams, sec. 34-8s-1e. Cg. sh. 6,703 ft.

J. G. Mayo et al. No. 1 Bank of Commerce, sec. 19-7s-1e. M.I.M.

Allen Parish

Humble O. & R. Co. No. 3 Bel, located in cratered hole, sec. 26-6s-7w. 10¾-in. csg. 165 ft.; T.D. 2,870 ft.; 7-in. csg. 2,766 ft.; shot well; failed to stop flwg. S.W.; S.D.

Avoyelles Parish

Coastal Minerals No. 1 Purdy-Hess, sec. 25-2n-3e. Drk.; S.D.; high wtr.

Calcasieu Parish

D. D. Oil Co. No. 1 Lutcher Moore, sec 11-8s-13w. T.D. 8,447 ft.; D.S. stuck; fsg. hole cleaned to 6,500 ft.; abd.

Cameron Parish

Humble O. & R. Co. No. 1 Hanzen, sec. 5-12s-6w. Drlg. sh. 1,368 ft.

Pure Oil Co. No. 2 State, sec. 14-13s-3w. Moving in.

Southern Sulphur Co. No. 2 State, sec. 29-15s-10w. S.D. 2,611 ft.

Union Sulphur Co. No. 1 J. O. Hebert, sec. 18-12s-8w. T.D. 8,336 ft.; (cor.); 7-in. csg. 8,336 ft.; perf. csg. 8,324-29 ft. I.P. 560 B.P.D.; ¼-in. ck.; T.P. 1,510 lbs.; grav. 38.9.

Cameron Parish—Gulf of Mexico

Superior Oil Prod. Co. et al No. 1 State-Gulf of Mexico, 3,800 ft. W, 6,200 ft. S of SE cor. of irregular sec. 4-15s-8w. Loc.

East Baton Rouge Parish

Cavalier Oil Co. No. 1 Elliott, sec. 3-9s-2e. R.U.

Cavalier Oil Co. No. 1 Jacobs, sec. 69-4s-1w. Spdd.

East Feliciana—Wild

Koch et al No. 1 Andrews, sec. 69-2s-3e. Drlg. 370 ft.

Evangeline Parish

Belle Chenney Springs Oil Co. No. 1 Belle Springs Land Dev. Co., sec. 10-2s-1w. Drld. to 2,215 ft.; S.D.

Iberia Parish

E. J. Beaullieu No. 1 Ozenine, sec. 9-13s-7e. T.D. 1,597 ft.; rmg.

Jefferson Lake Oil Co. No. 414 State Lake Pigneur, Twp. 12s-5e. Top salt 990 ft.; **set 10¾-in. csg. 5,095 ft.; top oil sd. 6,915 ft.; 7-in. csg. 6,930 ft.; cd. salt** 7,059-60 ft.; P.B. 5,500 ft.; drlg. sh. 5,-919 ft.

Texas Co. No. 2-B Vermilion Bay, Twp. 16s-5e. Move in.

Jefferson Parish

Louisiana Crusader Oil Corp. No. 1 Langley, sec. 36-7s-5w. T.D. 7,450 ft.; P.B. to sdtrk. at 6,868 ft.; cg. sdy. sh. 7,-625 ft.

Triangle Oil Co. No. 1 Conroe, sec. 125-12s-11e. T.D. 2,461 ft.; R.U.

Jefferson Davis Parish

Stanolind O. & G. Co. No. 2-B Calcasieu Natl. Bank, sec. 28-7s-3w. 13⅜-in. csg. 1,950 ft.; drlg. sh. 5,928 ft.

Lafourche Parish

Gulf Oil Corp. No. 3 State, sec. 36-23s-21e. R.U.

Pons Oil Co. No. 1 State Lake, sec. 65-17s-19e. 9⅝-in. csg. 8,384 ft.; drlg. sh. 8,610 ft.

Wm. Hellis No. 1 City of New Orleans, **sec. 19-23s-23e. T.D. 7,607 ft.; 7-in. csg.** on bttm.; P.B.; perf. csg. 7,303-33 ft.; tstg.

Livingston Parish

Coastline Oil Co. No. 1 Addison Trust Co., sec. 7-7s-3e. Drk.

Plaquemines Parish

Gulf Oil Corp. No. 1 Bay-Adams sec. 32-52s-19. Drlg. sd. 4,599 ft.

Tide Water Oil Co. No. 3 Manhattan Fruit Co., sec. 26-21s-30e. R.U.

Rapides Parish

C. L. Decker No. 1 Lee Lbr. Co., sec. 21-5n-3e. R.U.

R. D. Webb No. 1 A. M. Brasher, sec. 22-4n-2w. S.D. 5,236 ft.

St. Bernard Parish

Gulf Oil Corp. No. 1 Lake Lery, sec. 28-14s-14e. Drlg. sh. 6,191 ft.

Southern Sulphur Co. No. 2 State Lake Borgne, sec. 38-14s-15e. 13⅜-in. csg. 303 ft.; S.D. 3,170 ft.

St. Charles Parish

Amerada Pet. Corp. and La. Ld. & Expl. Co. No. 1 State, sec. 13-15s-20e. Drlg. sd. 4,900 ft.

St. Landry Parish

Gulf Oil Corp. No. 1 Haas & Hirsch, sec. 12-6s-7e. Drk.

Shell Pet. Corp. No. 1 Boagni, sec. 48-8s-4e. 10¾-in. csg. 2,521 ft.; drlg. sd. 8,-607 ft.

St. Martin Parish

Geo. E. Lilly et al No. 1 Martin, sec. 32-9s-7e. Drlg. sdy. sh. 1,103 ft.

Texas Co. No. 9 St. Martin, sec. 21-8s-7e. 18⅝-in. csg. 106 ft.; top salt 8,848 ft.; T.D. 8,858 ft.; tstd. S.W. 7,945-70 ft.; abd.

Texas Co. No. 3 State, sec. 14-10s-9e. cmtd. on bttm.; drlg. sdy. L. 8,174 ft. (cor.).

St. Mary Parish

Texas Co. No. 1 Horse Shoe Bayou, sec. 40-17s-9e. T.D. 10,975 ft.; 7⅝-in. csg. 18-in. csg. 101 ft.; T.D. 12,261 ft.; blew out; caught fire; burned for 1 hr. and hole bridged; W.O.

Texas Co. No. 1 State-Bateman Lake, sec. 21-16s-12e. T.D. 8,953 ft.; reset barge.

Terrebonne Parish

Humble O. & R. Co. No. 1 H. J. Ellender, **sec. 23-19s-19e. 9⅝-in. csg. 8,735 ft.; T.D. 12,165 ft.; 7-in. csg. 12,101 ft.; perf. csg. 12,013-18 ft.; 250 lbs. pressure; rng. perf. csg. 11,620-30 ft.; 11 shots flwd. est. 50 bbls. of fluid per hr.; ¼-in. ck.; 35% emulsion and S.W.; C.P. 4,600 lbs.; T.P. 3,100 lbs.; killed well; P.B. 11,609 ft.; perf. csg. 11,610-15 ft.; comp. for I.P. of 35 bbls. of fluid per hr.; ¼-in. ck.; 8% wash wtr.; no S.W. C.P. 2,750 lbs.; T.P. 3,100 lbs.; grav. 36.**

ARKANSAS

Clark County

Carter & Burdick No. 1 Ozan Lbr. Co., NE NE SW sec. 25-9-19. S.D. 1,396 ft.

Columbia County

Robt. Keene et al No. 1 Rungon, SE NE sec. 1-16s-21w. Drk.

Dallas County

J. C. Kelly No. 1 Serrells, SE SE SW sec. 35-10-16. R.U.

J. C. Kelly No. 1 Serrells, SE SE SW sec. 35-10-16. M.I.M.

Hempstead County

H. D. Easton et al No. 1 R. M. Lagrove, C NE NE sec. 5-12-26w. M.I.M.

E. H. Moore, Inc. No. 1 fee, NE cor. E½ SE¼ sec. 21-14-25. Drlg. 2,170 ft.

Shephard & Todd et al No. 1 Smith, NW SW SE sec. 11-11-25. S.D. 1,736 ft.; high water.

Howard County

Beetcher O. & G. Co. No. 1 Ark. Portland Cmt. Co., NW NW NW sec. 28-11-27. Loc.

Lincoln County

Fitzwater, Inc., No. 1 B. Owens, NW SW NE sec. 26-9s-8w. M.I.R.

Little River County

Joe Strahan No. 1 Dierks, SW SE sec. 21-12-28. Drlg. 1,720 ft.

Lonoke County

Frank F. Silvers No. 2 Chambers, SW NE NW sec. 17-2n-7w. Drlg. 998 ft.

Miller County

E. H. Moore No. 2 Dale, 660 ft. N and W, C sec. 24-15-26. Cg. 4,535 ft.

E. H. Moore No. 3 Dale, 660 ft. W of No. 7, sec. 24-15-26. T.D. 4,270 ft.; D.&A.

Standard Oil Co. No. 1 Sarah Harvey, SW SW SW sec. 33-16s-26w. Loc.

Miller County—Rodessa

McClanahan et al No. 1 W. L. Capps, sec. 11-20-28. Drlg. 4,667 ft.

Nevada County

Benedum & Trees No. 1 Grove, sec. 10-14-20. O.W.D.D.; T.D. 4,317 ft.; tstg. S.W.; S.D.

Berry Asphalt Co. No. 2 J. Haynie, NE SE SW sec. 6-14-20. T.D. 1,239 ft.; cg. oil sd.; W.O.S.R.

Berry Asphalt Co. No. 3 W. Haynie, SE NE SW sec. 6-14-20. T.D. 1,166 ft.; W. O.S.R.

Hall & Briscoe No. 2 Ritchie, NE NW SE sec. 10-14-20. T.D. 1,258 ft.; W.O.S.R.

Wm. S. King No. 1, sec. 6-13-22. T.D. 3,120 ft.; S.D.

A. M. Lacy No. 1 H. C. Bennett, SW SE sec. 24-14s-22w. Lse. abd.

Walter Lowd No. 1 T. S. Grayson, SW SW SE sec. 12-14-20. S.D. 2,409 ft.

Shepard, Traylor & Jones No. 1 Purifey, NE NE sec. 17-11-20. Drlg. 500 ft.

Ouachita County

Copenhaver Oil Corp. No. 1 J. E. Evans, C sec. 20-11-19. M.I.R.

H. H. Taylor No. 1 Joe McCree, NW SW NW sec. 21-12-19. Drlg. 2,205 ft.

Pulaski County

A. L. Kilselman No. 2 Kilselman, Jr., SE SE SW sec. 2-1s-13e. S.D. 844 ft.

Sevier County

C. J. Benkley No. 1 Dierks Lbr. Co., NW NE SE sec. 14-10-29w. T.D. 110 ft.; D.&A.

Union County

Alice-Sydney Oil Co. No. 1 Morgan, NW NE SE sec. 18-18-17. Drlg. 3,730 ft.

Bruce Hunt No. 1 Robbins, 330 ft. N and E, SW SW SE sec. 12-19s-16. S.D. 50 ft.; curing titles.

Lion Oil No. 2-B Edna Morgan, SW NW SE sec. 18-18-17. Drlg. 4,940 ft.

Marine Oil Co. No. 1 Marcus Justiss, NW¼ sec. 18-18-17. Cg. 5,610 ft.

Marine Oil Co. No. 6-E W. B. Thompson, SW NE NE sec. 10-18-13. T.D. 3,585 ft.; W.O.S.R.

W. D. Wingfield et al No. 1 So. Kraft Corp., SW NE sec. 18-16-14. Drlg. 2,-190 ft.

TEXAS

Week Ending May 22

GULF COAST FIELDS

Raccoon Bend—Austin County

Humble O. & R. Co. No. 12-X Austin College, Wm. Harvey Sur. T.D. 4,283 ft.; abd.

Humble O. & R. Co. No. 11-G Wilson, Wm. Harvey Sur. Drk.

Hastings—Brazoria County

Goldson and Humble O. & R. Co. No. 3 Roos, Sarah McKissick Sur. Drlg. L. 4,410 ft.

W. L. Goldston et al No. 2 Thomas-Ross, S. McKissick Sur. T.D. 6,108 ft.; 7-in. csg. 6,088 ft.

Humble O. & R. Co. No. 4-B Brown, Perry & Austin Sur. T.D. 6,080 ft. sand.

Humble O. & R. Co. No. 1 Hawley, B.B. B.&C. Sur. Coring sd. 6,100 ft.

Humble O. & R. Co. No. 1 Knack, Perry & Austin Sur. R.U.

Humble O. & R. Co. No. 1 Cecil O'Connor, H.T.&B. Sur. No. 29. T.D. 6,080 ft.; W.O.C.

Navarro Oil Co. No. 1-A W. F. Beers, Perry & Austin Sur. Drlg. sh. and L. 4,787 ft.

Navarro Oil Co. No. 2-A W. F. Beers, Perry & Austin Sur. Drk.

Navarro Oil Co. No. 2-B W. F. Beers, Perry & Austin Sur. Drlg. sh. 5,239 ft.

Stanolind O. & G. Co. No. 4 Floyd Brown, H.T.&B. Sur. No. 29. 10¾-in. csg. 1,-662 ft.; T.D. 5,925 ft.; 7-in. csg. 5,682 ft.

Stanolind O. & G. Co. No. 1 J. F. Butts, H.&T.B. Sur. Drlg. sh. 5,904 ft.

Stanolind O. & G. Co. No. 1 Mary Condon, H.T.&B. Sur. No. 29. 16-in. csg. 90 ft.; drlg. sh. 5,980 ft.

Stanolind O. & G. Co. No. 3 T. C. Edwards, Wm. Henry Sur. R.U.

Stanolind O. & G. Co. No. 2 J. M. Elliott, Wm. Henry Sur. T.D. 6,075 ft., sand.

Stanolind O. & G. Co. No. 11-B H. H. Ford, H.T.&B. Sur. No. 29. T.D. 6,080 ft.; 7-in. csg. 5,624 ft.

Stanolind O. & G. Co. No. 4 Law, H.T.&B. Sur. No. 36. Drk.

Stanolind O. & G. Co. No. 3 J. C. Hutchins, H.T.&B. Sur. No. 36. Drk.

Stanolind O. & G. Co. No. 2 A. C. McKibben, H.T.&B. Sur. No. 29. T.D. 6,080 ft. 7-in. csg.; flowed 79 bbls. in 19 hrs.

Stanolind O. & G. Co. No. 3 L. F. McKibben, H.T.&B. Sur. No. 29. Drk.

Stanolind O. & G. Co. No. 1 Massey, H. T.&B. Sur. No. 29. T.D. 1,640 ft.; run surf. csg.

Stanolind O. & G. Co. No. 5 Steve Paul, A.C.H&B. Sur. Drlg. sand 5,854 ft.

Stanolind O. & G. Co. No. 6 Steve Paul. A.C.H.&B. Sur. No. 2. Drk.

Stanolind O. & G. Co. No. 7 Steve Paul, A.C.H.&B. Sur. No. 2. Drlg. sh. 3,758 ft.

Stanolind O. & G. Co. No. 4 S. A. Pennock, H.T.&B. Sur. No. 36. Drlg. gas sand 5,299 ft.

Stanolind O. & G. Co. No. 4 Surface, B. B.B.&C. Sur. R.U.

Stanolind O. & G. Co. No. 5 J. W. Surface, A.C.H.&B. Sur. Drlg. sh. 3,054 ft.

Lockridge—Brazoria County

Gulf Oil Corp. No. 2 Gibson, J. W. Hall Sur. Drlg. sdy. sh. 4,448 ft.

Gulf Oil Corp. No. 2 Fred Reiss, J. W. Hall Sur. T.D. 1,300 ft.; W.O.C.

Gulf Oil Corp. No. 1-A G. L. Wood et al, Thomas Alsberry Sur. No. 4, Abst. No. 2. 13⅜-in. csg. 1,431 ft.; T.D. 6,386 ft.; 9⅝-in. csg. 6,374 ft.; tested S.W. and sd. 6,365-70 ft.; P.B. 6,3500 ft.; testing.

Gulf Oil Corp. No. 4-A Wilkes and Smith, J. W. Hall Sur. R.U.

Shell Pet. Corp. No. 3 Ramsey State Farm, J. W. Hall Sur. No. 11. 10¾-in. csg. 1,390 ft.; core sandstone 6,776 ft.

Manvel—Brazoria County

Allhands and Davis No. 1 Lambert, E. Little Sur. Drlg. sh. 2,737 ft.

Burton Drlg. Co. No. 1 Arnold, E. Little Sur. Abd.; T.D. 4,099 ft.

E. A. Stone No. 1 Nichols, E. Little Sur. Drk.

Texas Co. No. 16-A W. T. Belcher, H. N. Little Sur. Drlg. sh. and L. 4,850 ft.

Texas Co. No. 25 Houston Oil Field Assn., A.C.H.&B. Sur. No. 91. T.D. 5,660 ft., sand.

Texas Co. No. 7 Rash, T. Spraggins Sur. Drlg. 1,630 ft.

Old Ocean—Brazoria County

Harrison & Abercromble No. 1-A Bernard Land & Dev. Co. O.W.D.D.; drlg. sh. 9,597 ft.

Harrison and Abercrombie No. 4 Bernard River Ld. and Development Co., Charles Breen Sur. 13⅜-in. csg. 1,405 ft.; 9⅝-in. csg. 7,005 ft.; sh. 9,667 ft.

Sandy Point—Brazoria County

Bunte O. & G. Co. No. 1 A. A. Sharp, Chester S. Gorbot Sur. Drlg. sh. and L. 5,111 ft.

Bunte O. & G. Co.-Florence Investment Co. No. 1 Fite. T.D. 6,568 ft., S.W. sd.

J. F. Driscoll No. 1 J. W. Fullet, Lavaca Navigation Sur. No. 3. Loc. (cor.).

Calhoun—Heyser—Victoria County

George Echols No. 4 Bennett, J. Galban Sur. T.D. 5,491 ft.; 7-in. csg. set on bottom; reworking.

Humble O. & R. Co. and Plymouth Oil Co. No. 12-A P. H. Welder, A. Sisneros Sur. Drlg. sh. 5,067 ft.

Humble O. & R. Co. and Plymouth Oil Co. No. 13-A P. H. Welder, A. Sisneros Sur. Drk.

Humble Oil and Plymouth Oil Co. No. 14-A P. H. Welder, J. M. Rios Sur. Drlg. sh. 4,378 ft.

Humble O. & R. Co. No. 15-A P. H. Welder, J. M. Rios Sur. Drk.

Humble O. & R. Co. No. 16-A P. H. Welder, J. M. Rios Sur. Drk.

Portilla Drlg. Co. No. 8 P. H. Welder, D. D. Palmer Sur. Drk.

Anahuac—Chambers County

Gulf Oil Corp. No. 9 Knowles, W. T. Knowles Sur., H.&T.C. Sur. No. 48. Coring sh. 7,005 ft.

Gulf Oil Corp. No. 2 Pommer, sec. 40, H. &T.C. Sur. R.U.

Humble O. & R. Co. No. 2 H. O. Acom, H.T.&B. Sur. No. 23. Drk.

Humble O. & R. Co. No. 12 Broussard, H.&T.C. Sur. No. 59. Drk.

Humble O. & R. Co. No. 12 Gripon, H.& T.C. Sur. No. 51. Drlg. sh. 7,087 ft.

Humble O. & R. Co. No. 8 C. Johnson, sec. 48, H.&T.C. Sur. Drlg. sh. 7,121 ft.

Humble O. & R. Co. No. 3 Lord, H.&T.C. Sur., sec. 50. Drk.

Humble O. & R. Co. No. 13-B White, J. McGahey Sur. Drlg. sh. 6,940 ft.

Humble O. & R. Co. No. 5 Wilcox, sec. 50, H.&T.C. Sur. T.D. 7,080 ft.; W.O.C.

Cotton Lake—Chambers County

Salt Dome Oil Co. No. 2-C Lawrence, S. Barrow Sur. 10¾-in. csg. 1,104 ft.; split sur. csg.; skidded drk. for new hole; drlg. sh. 3,367 ft.

Seabreeze—Chambers County

Sun Oil Co. No. 2 H. O. Acom, H.T.&B. Sur. No. 23. 18⅝-in. csg. 91 ft.; drlg. sh. 2,378 ft.

Sun Oil Co. No. 1-A Broussard-Hebert, T. &N.O. Sur. No. 127. 13⅜-in. csg. 1,-366 ft.; T.D. 8,781 ft.; cemented 7-in. csg. 8,380 ft.

Turtle Bay—Chambers County

Stanolind O. & G. Co. No. 1 Earl R. Davis, Chadrick Burney Sur. Drk.

Big Creek—Fort Bend County

Barnett Pet. Corp. No. 2 J. H. P. Davis, B. Nickson Sur. T.D. 3,080 ft.; fsg.

Gulf Oil Corp. No. 75 T. W. Davis, M. Young Sur. T.D. 3,135 ft.; to make D. S.T.

Blue Ridge—Fort Bend County

Telshaw-Reese and Echelson No. 1 Blakely, E. Drew Sur. R.U.

Boling—Fort Bend County

John Deering No. 1 J. M. Moore, Charles Bettner Sur. T.D. 5,268 ft.; P.B. and S.T.; drlg. sh. 4,324 ft.

Mack Hank Oil Co. No. 3-A J. R. Farmer, J. Scott Sur. Drlg. sh. 2,870 ft.

Mack Hank Oil Co. No. 5-C E. C. Farmer. J. Scott Sur. Drlg. sh. 2,207 ft.

Thompson—Fort Bend County

H. M. Naylor No. 11 Gehr, S. Kennedy Sur. T.D. 5,398 ft.; 7-in. csg. 5,280 ft.; R.U. to pmp.

Orchard—Fort Bend County

Gulf Oil Corp. No. 52 Moore, James Frazier Sur. Drlg. sh. 3,112 ft.

Gulf Oil Corp. No. 53 Moore, J. Frazier Sur. Spdd.

High Island—Galveston County

Stanolind O. & G. Co. No. 1-B Cade, B. Denman Sur. Drlg. sh. 7,208 ft.

Stanolind O. & G. Co. No. 61 Cade, N Fitzsimmons Sur. Drlg. sdy. sh. 5,412 ft.

Stanolind O. & G. Co. No. 15-A Smith, M. Dunman Sur. Drlg. sh. 1,817 ft.

Stanolind O. & G. Co. No. 62-A Cade, M. Fitzsimmons Sur. Drlg. 2,417 ft.

Dickinson—Galveston County

Atlantic O. & R. Co. No. 2 Sealy Hutchins, P. G. Merritt Sur. Drlg. sh. 6,912 ft.

Diadem Oil Corp. of Texas No. 2 W. J. Way, E. P. Epperson Sur. T.D. 8,198 ft.; 6⅝-in. csg. 8,191 ft.; perf. csg. 8,058-62 ft.; tstd. S.W.; cmtd. perf. csg.; made squeeze job; perf. csg. 8,133-44 ft. R.U. to drill ahead.

Diadem Oil Corp. of Texas No. 1 Pauline Frederick. Loc.

Humble O. & R. Co. No. 1 Kilgore, W. K. Wilson Sur. Drk.

Humble O. & R. Co. No. 15-A Maco Stewart, W. K. Wilson Sur. Drk.

Humble O. & R. Co. No. 19-A Maco Stewart, W. K. Wilson Sur. Drlg. sh. 8,192 ft.

Humble O. & R. Co. No. 8-B M. Stewart, W. Wilson Sur. Drlg. 5,890 ft.

Kenben Oil Co. No. 4 Maco Stewart, W. K. Wilson Sur. Core sh. 8,730 ft.

W. E. McKinney et al No. 3-A Galveston-Houston Elec. R.R., W. K. Wilson Sur. T.D. 8,510 ft.; P.B. to sdtrk.; sdtrkd. at 8,300 ft.; drlg. ahead.

Pan American Prod. Co. No. 3 Craig, W. K. Wilson Sur. Drk.

Pure Oil Co. No. 1-B Sealy Hutchins, P. G. Merritt Sur. T.D. 8,146 ft.; 5½-in. csg. on bttm.; perf. csg. 8,088-98 ft.; make D.S.T.

Sinclair Prairie Oil Co. No. 1 W. Weems, W. K. Wilson Sur. Loc.

Stanolind O. & G. Co. No. 2 Dameant W. K. Wilson Sur. Drlg. sdy. sh. 8,673 ft.

Stanolind O. & G. Co. No. 7 State. 13⅜-in. csg. 2,013 ft.; drlg. sh. 5,028 ft.

Turman Oil Co. and Maco Stewart No. 1 Stewart, W. K. Wilson Sur. Core sd. and sh. 8,857 ft.; no report.

Turman Oil Co.-Maco Stewart No. 2 Stewart, W. K. Wilson Sur. Drk.

Greens Lake—Galveston County

Sun Oil Co. No. 8 Hughes, W. C. M. Baker Sur. 7-in. csg. 3,890 ft.; drlg. sh. 5,512 ft.

Batson—Hardin County

Bunte O. & G. Co. No. 1 Melhome, J. Melhome Sur. T.D. 3,430 ft.; run 7-in. csg.

Silsbee—Hardin County

Republic Prod. Co.-Houston Oil Co. No. 11 Brooks, G. W. Brooks Sur. 10¾-in. csg. 1,441 ft.; T.D. 6,964 ft.; P.B. 5,683 ft.; drld. into old hole; P.B. 5,400 ft.; drlg. sdy. sh. 6,890 ft.

Republic Prod. Co-Houston Oil Co. No. 14 Brooks, G. W. Brooks Sur. Drlg. sh. 5,407 ft.

Republic Prod. Co.-Houston Oil Co. No 15 Brooks. T.D. 6,965 ft.; run 7-in. csg.

Bammel—Harris County

Geo. Lawrence No. 2 Zapp, J. Farwell Sur. R.U.

Clinton—Harris County

Stanolind O. & G. Co. No. 1 D. A. Oates, C. Martinez Sur., Abst. 543, 9⅝-in. csg. 6,771 ft.; drlg. sdy. sh. 8,067 ft.; top gas sd. 8,063 ft.; T.D. 8,783 ft.; P.B. 8,088 ft.; run tbg. and lnr.

Goose Creek—Harris County

Bob Foster No. 1 Esenhour, Wm. Scott Sur. Drlg. 1,500 ft.

Sun Oil Co. No. 1 A. Smith, Wm. Scott Lower Lge. Drlg. sd. and sh. 4,281 ft.

Fairbanks—Harris County

Amerada Pet. Corp.-Stanolind O. & G. Co. No. 1 W. Jacobs, Blk. 1, sec. 2, W.C.R. R. Sur. 10¾-in. csg. 1,430 ft.: T.D. 7,256 ft.; P.B. 6,835 ft.; perf. csg. 6,824-28 ft.; flwd. oil and some S.W.; recmtg.

Humble—Harris County

Texas Co. No. 273 Landslide. Robt. Dunman Sur. 10-in. csg. 706 ft.; drlg. sh. 3,217 ft.

Pierce Junction—Harris County

A. & P. Production Co. No. 9 Whitehead, J. Hamilton Sur. No. 51. Cg. sd. 3,390 ft. no report.

Gulf Oil Corp. No. 42 Taylor, J. Hamilton Sur. Drk.

South Houston—Harris County

Smith and McDannald No. 2 L. R. Phillips, Lot 146, H.T.&B. Sur. No. 6. Spdd.

Stanolind O. & G. Co. No. 1 Bennett, Unit 13, H.T.&B. Sur. No. 6. 16-in. csg. 90 ft.

Stanolind O. & G. Co. No. 2 Dist. No. 8. T.D. 4,775 ft.; 5¾-in. csg. 4,617 ft.; I.P. 386 B.P.D.; ¼-in. ck.

Stanolind O. & G. Co. No. 2, Dist. 9. 9⅝-in. csg. 1,407 ft.; T.D. 4,736 ft.; 5¾-in. csg. 4,627 ft.; I.P. 388 B.P.D.; ¼-in. ck.

Stanolind O. & G. Co. No. 2, District 21 9⅝-in. csg. 1,438 ft.; T.D. 4,825 ft.; I.P. 384 B.P.D.; ¼-in. ck.

Stanolind O. & G. No. No. 2 District 22. 9⅝-in. csg. 1,459 ft.; T.D. 4,775 ft.; 5¾-in. csg. 4,679 ft.; I.P. 505 B.P.D.; ¼-in. ck.

Stanolind O. & G. Co. No. 2, Dist. No. 23. Drlg. sh. and L. 2,042 ft.

Tomball—Harris County

Amerada Pet. Corp. and Stanolind O. & G. Co. No. 2 W. W. Baker, J. House Sur. R.U.

George Echols No. 1 J. W. Woods, J. Pruitt Sur. T.D. 5,607 ft.; abd.

Humble O. & R. Co. No. 6 Farris I. Mitchell Sur. T.D. 5,551 ft.; I.P. 540 B.P. D. through ¼-in. choke.; comp. for gas well.

Humble O. & R. Co. No. 6 W. H. Gossett, E. Smith Sur. Drlg. sh. 962 ft.

Humble O. & R. Co. No. 5 F. T. Heis, C. N. Pillot Sur. Drlg. sh. 972 ft.

Humble O. & R. Co. No. 5 W. E. Hoffman, J. House Sur. T.D. 5,593 ft.

Humble O. & R. Co. No. 2 Joheke J. K. Edwards Sur. T.D. 5,597 ft.; I.P. 465 B.P.D. through ¼-in. choke.

Shell Petroleum Corp. No. 2 Keys, J. Pruitt Sur. Core sh. 5,522 ft.

Ganado—Jackson County

Texas Co. No. 1 Hultquist, D. Dempsey Sur. 10-in. csg. 1,210 ft.; cg. sd. S.O.&G.

Amelia—Jefferson County

Humble O. & R. Co. No. 1 J. H. Deer et al, Unit 51. Drlg. sh. 6,030 ft.

Humble O. & R. Co. No. 1-A J. A. Dishman. Drlg. sh. 6,258 ft.

Humble O. & R. Co. No. 1-B Dishman. C. Williams Sur. Drlg. sh. 1,325 ft.

Humble O. & R. Co. No. 1-D Dishman, Unit 31. Drlg. sh. 5,630 ft.

Humble O. & R. Co. No. 1-F Dishman, Blk. C. Drlg. L. 5,530 ft.

Humble O. & R. Co. No. 1-B Ephlin, Lot 18, Blk. D, C. Williams Sur. Drlg. sh. 6,512 ft.

Humble O. & R. Co. No. 2 T. H. Crook. C. Williams Sur. 9⅝-in. csg. 1,473 ft.; T.D. 6,778 ft.; I.P. 656 B.P.D. through ¼-in. choke.

Humble O. & R. Co. No. 1-B Halton-Ephlin Morgan, Lot 25, C. Williams Sur. Drlg. sh. 5,244 ft.

Humble O. & R. Co. No. 5 Guinn, C. Williams Sur. R.U.

Humble O. & R. Co. No. 7 Guinn, C. Williams Sur. T.D. 6,778 ft.; I.P. 648 B.P.D.

Humble O. & R. Co. No. 3 Industr Investment Co., C. Williams Sur. T.D. 6,779 ft.; I.P. 679 B.P.D. through ¼-in. choke.

Humble O. & R. Co. No. 3 Langham, C. Williams Sur. 9⅝-in. csg. 1,041 ft.; T.D. 6,781 ft.

Humble O. & R. Co. No. 4 Phelan, C. Williams Sur. Drlg. sh. 6,000 ft.

Humble O. & R. Co. No. 1 W. M. Wohlfert, C. Williams Sur. T.D. 6,779 ft.; I.P. 665 B.P.D. through ¼-in. choke; completed, no gauge.

Glenn H. McCarthy No. 5 Longe, H. Williams Sur. T.D. 5,412 ft.; run lnr.

Glenn H. McCarthy No 6 Longe, H. Williams Sur. Drk.

Normandie Oil Co. No. 1 R. J. Peveto, C. Williams Sur. T.D. 6,780 ft.; perf. csg. 6,778-80 ft.; I.P. 676 B.P.D. through ¼-in. choke.

Normandie Oil Co. No. 2 R. J. Peveto, C. Williams Sur. Drlg. sh. 1,510 ft.

Feyton Bros. No. 1 Pansy Yount, A. Houston Sur. Abd. 7,018 ft.

Stanolind O. & G. Co. No. 1 J. W. Hall. H. Williams Sur. T.D. 6,103 ft.; perf. csg. 6,099-6,101 ft.; perf. csg. 5,352-67 ft., showed run screen.

Stanolind O. & G. Co. No. 1, McCormick Sur. 10¾-in. csg. 1,629 ft.; T.D. 5,385 ft.; 7-in. csg. 5,350 ft.

Stanolind O. & G. Co. No. 2 Sargl, H. Williams Sur. 16-in. csg. 60 ft.; T.D. 6,100 ft.; 7-in. csg. 6,020 ft.; P.B. 6,016 ft.; perf. csg. 5,982-86 ft.; run screen.

Stanolind O. & G. Co. No. 3 Sargl, H. Williams Sur. R.U.

Big Hill—Jefferson County

Stanolind O. & G. Co. No. 2 M. E. Fitzhugh, Wm. McFaddin Sur. Drlg. sh. 2,212 ft.

Stanolind O. & G. Co. No. 4-A Pipkin. T.&N.O. Sur. Spudded.

Fannett—Jefferson County

Gulf Oil Corp. No. 8 Junker, Wm. Smith Sur. Spudded.

LaBelle—Jefferson County

Sun Oil Co. No. 1 John Ward, 933 ft. S of No. 2 Broussard, Wm. Burton Sur. 18⅝-in. csg. 109 ft.; T.D. 8,598 ft.; 9⅝-in. csg. 8,538 ft.; W.O.C.

Nome—Jefferson County

Shell Petroleum Corp. No. 2 Texas Public Service Co., W. H. Aldridge Sur. T.D. 6,050 ft.; 5-in. csg. 6,022 ft.

Shell Pet. Corp. No. 1 Unit "B," M. E. Peveto Sur. T.D. 6,048 ft.; 5-in. csg. 6,008 ft.

Shell Pet. Corp. No. 2 Unit "B," M. E. Peveto Sur. R.U.

Sun Oil Co. No. 2 J. E. Burrows, J. Blair Sur. Drlg. sh. 2,319 ft.

Sun Oil Co. No. 4 Hugh Longe, J. Blair Sur. T.D. 6,050 ft.; 5½-in. csg. 6,000 ft. I.P. 420 B.P.D.

Sun Oil Co. No. 5 Long, J. Blair Sur. Loc.

Sun Oil Co. No. 1 A. J. Mouboules, J. Blair Sur. 10¾-in. csg. 1,062 ft.; T.D. 8,768 ft.; P.B. 8,175 ft.; tstd. S.W.; P.B. and sdtrkd.; T.D. 5,678 ft.; 7-in. csg. 5,630 ft.; swbd. S.W.; cutting lnr.

Sun Oil Co. No. 7 Paggi-Aldridge Sur. T.D. 6,052 ft.; 7-in. csg. 6,000 ft.; comp. for gas well.

Sun Oil Co. No. 8 Paggi, J. W. Kirby Sur. R.U.

Cleveland—Liberty County

Gulf Oil Corp. No. 18-C Kirby, J. Pleasant Sur. R.U.

Esperson—Liberty County

General Crude Oil Co. No. 29 Moores-Bluff, M. Dunman Sur. Drlg. 850 ft.

Hull—Liberty County

Bishop Oil Co. No. 1 C. R. Wilson, J. Devore Sur. Oil sd. 780-88 ft.; drlg. sh. 3,926 ft.

Eclipse Oil Co. No. 1 Barrow. T.D. 5,014 ft.; S.D.

Gulf Oil Corp. No. 23 Baldwin, J. Devore League Sur. Oil sd. 4,975-5,014 ft.; T.D. 5,016 ft.

Hamil and Smith No. 1 Barngrover, J. Devore Sur. Drlg. sh. 6,100 ft.; no report.

Republic Prod. Co. No. 162 Dolbear, J. Devore Sur. T.D. 2,960 ft.; P.B. and sdtrkd.; drlg. sh. 3,015 ft.

Texas Co. No. 7 Hannah fee, J. Devore Sur. Drk.

Bay City—Matagorda County

Hamman Expl. Co. No. 2 Cleveland, E. Hall Sur. Drlg. sd. and sh. 6,220 ft.

Palacios—Matagorda County

Glenn H. McCarthy No. 1 Foley Land Co., L. Goodwin Sur. Drlg. sh. 4,839 ft.

Hawkinsville—Matagorda County

Sun Oil Co. No. 2 Craig, T. Williams Sur. Top salt 796 ft.; base salt 2,099 ft.; 18⅝-in. csg. 2,174 ft.; 13⅜-in. csg. 3,700 ft.; 9⅝-in. csg. 5,689 ft.; T.D. 5,969 ft.; hole cleaned; drlg. ahead.

Van Vleck—Matagorda County

Skelly Oil Co. No. 2 Johnson, M. Cummins Sur. Drlg. sh. 5,042 ft.

Skelly Oil Co. No. 2 Grace Moore. I.&G.N Sur. T.D. 7,495 ft.; 7-in. csg. 7,494 ft.; perf. csg. 7,489-93 ft.; I.P. 711 B.P.D.; ¼-in. ck.

Orange—Orange County

Texas Co. No. 12 A. J. Kuhn, T. J. Nolgrass Sur. Drk.

Livingston—Polk County

Ownby Drlg. Co. No. 10 Pratt, A. Viesca Sur. Core sdy. sh. 4,180 ft.

Segno—Polk County

J. K. Dorrance No. 1 Sarah F. Wing, I.&G N. Sur. No. 15. Drlg. 5,195 ft.; 7-in. csg. 5,177 ft.; split csg.; 5-in. csg. 5,177 ft.; tstg.

J. K. Dorrance No. 2 Wing, I.&G.N. Sur. No. 15. Bldg. drk.

J. K. Dorrance No. 4 Wing, I.&G.N. Sur. No. 15. T.D. 5,195 ft.; run 5-in. csg.

Gulf Oil Corp. No. 1 Ragan, I.&G.N. Sur. No. 15. R.U.

Gulf Oil Corp. No. 2 Wing, I.&G.N. Sur. No. 15. Loc.

Humble O. & R. Co. No. 3-B Kirby Lbr. Co., Marcell Victor Sur. T.D. 5,342 ft., sd.; make D.S.T.

Laquinta Oil Co. No. 2 Wing, I.&G.N. Sur. No. 15. T.D. 5,194 ft.; run 7-in. csg.

Laquinta Oil Co. No. 3 Wing, I.&G.N. Sur. No. 15. Loc.

Rajo Oil Corp. No. 1 Wing, I.&G.N. Sur. No. 15 T.D. 5,198 ft.; 7-in. csg. 5,182 ft.; flwg. into pits; no gauge.

Quintana-O'Connor-Greta—Refugio County

Cosmo Pet. Co. No. 16 Heard, Blk. 119, Refugio Townsite. T.D. 4,937 ft.; tested dry, deepening.

Hewitt and Daugherty No. 46 Lambert, J. M. Swisher Sur. T.D. 5,900 ft.; tstg.

Houston Oil Co. No. 31 Rooke, T. Mullen Gr. T.D. 4,917 ft.; 7-in. csg. 4,907 ft.; I.P. 337 B.P.D.; ¼-in. ck.

Quintana No. 6 Heard, Webb Sur. T.D. 5,925 ft.; W.O.C.

Quintana No. 15-C Tomoconnor, Swisher Sur. Drlg. sh. 5,712 ft.; no report.

Quintana Oil Co. No. 48-A Tomoconnor, Swisher Sur. Drlg. sh. 5,865 ft.

United Gas Co. No. 49 Lambert, Swisher Sur. T.D. 5,915 ft.; tstg.

United Gas Co. No. 52 Lambert, Swisher Sur. Drlg. sh. 4,665 ft.

United Gas Co. No. 54 Lambert, J. M. Swisher Sur. Drlg. 1,510 ft.

United Gas Corp. No. 12 J. J. O'Brien. drlg. csg. 8,357 ft.

United Gas Co. No. 9, Ryals Townsite. Drlg. 1,210 ft.

United Gas Corp. No. 42 Tomoconnor, Swisher Sur. Drlg. sh. 5,267 ft.

Spurger—Tyler County

Republic Production Co.-Houston O. Co No. 3 Hurd, N. Hurd Sur. 10¾-in. csg. 2,331 ft.; W.O.C.

Keeran—Victoria County

Gulf Oil Corp. No. 11 J. M. Keeran, M. DeLeon Sur. Drlg. sdy. sh. 5,812 ft.

Union Oil Co. of Calif. No. 4 Keeran, M. DeLeon Sur. T.D. 6,004 ft.; perf. csg. 5,967-69 ft.; tstg.

McFadden—Victoria County

Transwestern Oil Co. No. 3 J. A. McFadden, Julus Varian Sur. Drlg. sh. 4,113 ft.

Placedo—Victoria County

Barnsdall-American Liberty Oil Co., S.A. &M.G. Sur. No. 7. T.D. 890 ft.; W.O.C.; R.U.

Barnsdall-American Liberty Oil Co. No. 10 J. M. Pickering, Wm. Rupley Sur. T.D. 6,785 ft.; W.O.C.

Barnsdall Oil Co.-American Liberty Oil Co. No. 16 Pickering, S.A.&M.G. Sur T.D. 4,776 ft.; 7-in. csg. 4,752 ft.; I.P. 7 B.P.H.; ⅞-in. ck.

Lion O. & R. Co. No. 3 S. W. Wright, S.A.&M.G. Sur. Drlg. sh. 2,310 ft.

Magnolia Petroleum Co. No. 8 Sklar, S.A.&M.G. Sur. No. 17. Drlg. sh. 4,317 ft.

Portilla O. & G. Co. No. 1 T. P. Traylor, S.A.&M.G. Sur. No 11 T.D. 5,351 ft.; fsg.

Salt Mount Oil Corp. No. 1 O. A. Lola, Wm. Rupley Sur. Drlg. sh. 2,312 ft.

Shell Pet. Corp. No. 4 Houston Natl. Bank, S.A.&M.G. Sur. No. 7. T.D. 4,760 ft.; 7-in. csg. 4,756 ft.; I.P. 240 B.P.D.; ¼-in. ck.

Shell Pet. Corp. No. 5 Houston Natl. Bank, S.A.&M.G. Sur. R.U.

Superior Oil Prod. Co. No. 8 J. J. Hosek, S.A.&M.G. Sur. No. 1. T.D. 4,765 ft.; 7-in. csg. 4,756 ft.; tstg.

Superior-Gillespie No. 9 J. J. Hosek, S.A.& M.G. Sur. Drlg. 880 ft.

Superior Oil Co. and Gillespie No. 5 J. J. Hosek, S.A.&M.G. Sur. No. 7. T.D. 4,759 ft.; 7-in. csg. 4,754 ft.; cg. deeper.

Westgate Oil Co. No. 6 Mieska, S.A.&M.G. Sur. T.D. 4,779 ft.; I.P. 8 B.P.H.; ⅞-in. ck.

Clay Creek—Washington County

Oak Oil Corp. No. 1 G. Cockrell, J. F. Perry Square Sur. Drk.

Sun Oil Co. No. 6 Droger, J. Perry Sur. Drlg. sh. 2,312 ft.

Virginia Oil Co. No. 1 Joe Kenieczny, S. M. Williams Sur. 10¾-in. csg. 104 ft.; abd. 2,171 ft.

Five Corners—Wharton County

Texas Co. No. 7-B Pierce Est., J. Caldwell Sur. T.D. 5,555 ft.; 7-in. csg. 5,554 ft.

Louise—Wharton County

C. E. Oil Co. No. 1 R. C. Fair, Morris and Cummins Sur. No. 290. Drk.

Pure Oil Co. No. 6 McIntyre, Morris and Cummins Sur. No. 288. 9⅝-in. csg. 916 ft.; T.D. 5,160 ft.; 5½-in. csg. 5,160 ft completing.

Magnet—Wharton County

Atlantic Ref. Co. No. 1-B H. C. Cockburn. J. Smith and McKenzie Sur. Drk.

W. W. Van Allen-Texas Crusader No. 1 Sweet, J. Smith and McKenzie Sur. Drlg. sh. 1,827 ft.

Pickett Ridge—Wharton County

Texas Co. No. 33-A Pierce Est., G.B.&N Sur. No. 4; 9,000-ft. test. Drlg. sh. and L. 3,627 ft.

Texas Co. No. 1 Earnest Wittig, J. Telfener Sur. T.D. 4,598 ft.; 7-in. csg. 4,584 ft.; I.P. 60 B.P.D.; 6/64-in. ck.

Spanish Camp—Wharton County

Albert Plummer-Felmont Oil Corp. No. 2 M. Sarrell, S. F. Austin Sur. No. 1. T.D. 4,015 ft.; S.W. sd.; 5-in. csg. 3,903 ft.

Withers—Wharton County

Texas Co. No. 27-C Pierce Est., Wm. Pettus Sur. T.D. 5,554 ft.; 7-in. csg. 5,547 ft.; comp at allowable of 45 B.P.D.

Texas Co. No. 28-C Pierce Est., Wm. Pettus Sur. Drlg. 5,560 ft.

Texas Co. No. 29-C Pierce Est., Wm. Pettus Sur. 10-in. csg. 38 ft.; drlg. sh. 3,212 ft.

Texas Co. No. 30-C Pierce, Wm. Pettus Sur. Drlg. 369 ft.

GULF COAST WILDCATS

Austin County

Cockburn et al No. 1 Forester, S. J. Sloan Sur. Drlg. sh. 3,337 ft.

R. L. Hopkins No. 1 J. W. Recnecke, J. Stephenson Sur. Cg. sh. 4,459 ft.

Brazoria County

Pure Oil Co. No. 1 P. M. Slade, S. F Austin Lge. T.D. 7,842 ft.; D.S. stuck; cutting and pulling drill plug.

Texas Co. No. 2 Robbins, James W Brougham Sur. 13⅜-in. csg. 5,498 ft.; 9⅝-in. csg. 6,060 ft.

Colorado County

Coyle & Concord No. 3-B Powell, I.&G.N. Sur. No. 45. R.U.

Humble O. & R. Co. No. 1 Relaw Land Co., J. L. Duggan Sur. T.D. 1,600 ft.; W.O.C.

Fort Bend County

John Byers No. 1 Lockwood-Sharpe, Wm. McMahon Sur. M.I.

Marien Oil Co. No. 1 Frank Jurca, sec. 26, H.&T.C. Sur. Drk.

Trone No. 2 Trone, H.&T.C. Sur. No. 67. Drk.

Harris County

H. J. DeArman et al No. 1 Tyrell-Garth, L. Hemmingway Sur. Drlg. 6,418 ft.

Superior Oil Co. No. 1 Butler, Eehrhardt Sur. Drlg. sh. 5,600 ft.

Jefferson County

Magnolia Pet. Co. No. 1 J. H. Phelan, T.&N.O. Sur. No. 14. 13⅜-in. csg. 3,016 ft.; drlg. sh. 8,537 ft.

H. B. Smith and R. Smith No. 1, J. W. McGaffey Sur. Loc.

Lavaca County

Welshire Union Oil Co. No. 1-A Pohl, F. Bass Sur. T.D. 3,250 ft.; P.B. 2,950 ft., two tests failed; S.D.

Liberty County

Jack Frazier et al No. 1 B. F. Haoachy, Hughes B. Johnson Sur. R.U.

Matagorda County

Continental Oil Co. No. 2 Hawkins Est., D. McCarty Sur. 20-in. csg. 120 ft.; drlg. sdy. L. 3,104 ft.

Royal O. & G. Corp. No. 1 T. J. Ewing, Burnett and Sojouner Sur. Drlg. sd. 730 ft.

United North & South Development Co No. 1, J. S. Cotton Sur. T.D. 9,895 ft.; 7-in. csg. on bttm.; tstd. S.W. 9,769-81 ft.; squeeze off perforations.

Montgomery County

C. E. Gates No. 1 South Texas Long Leaf Lbr. Co., Walker Co. Sch. Ld. Spdd.

Polk County

T. J. Wood et al No. 1 Bertrand, A. Hodge Sur. Drlg. sh. and L. 4,812 ft.

San Jacinto County

Cockburn Oil Corp. et al No. 1 Whitten, Wm. West Sur. R.U.

Trinity County

McArthur & Nixon No. 1 Kountze, J. A. Hankins Sur. Run csg. 1,438 ft.

West Prod. Co. No. 1 Texas Long Leaf Lbr. Co., John Williams Sur. Drlg. sh. 2,532 ft.

Walker County

Garland, Hartman & Page No. 1 Carey Ld. & Dev. Co., D. M. McDonald Sur. R.U.

Waller County

Stanolind O. & G. Co. No. 1 Wm. Hargrove, T. S. Reese Sur., sec. 110. 10¾-in. csg. 2,510 ft.; T.D. 7,500 ft.; run 7-in. csg.

Washington County

K. D. Harrison and C. E. Starr No. 1 Charles and Wm. Ellerman, Wm. Bridges Lge. 13-in. csg. 290 ft.

Wharton County

S. G. Harrison and H. E. Williams No. 1 H.&G.H. Harfst, Lyman Conisrite Sur. T.D. 5,018 ft.; abd.

Smith and McDannald No. 1 Martin, I.& G.N. Sur. No. 16. Drlg. sh. 4,512 ft.

S. W. TEXAS WILDCATS

Aransas County

Barnsdall Oil Co. No. 1-A Kate Edwards, 330 ft. S line, Lot 85, 660 ft. SW No. Wm. Lewis Sur. D.S.T. 7,524-45 ft.; 32 min. unloaded wtr. cushion; drld. 7,935 ft.; well tried to blow out; cg. 7,973 ft.

Danray Oil Co. No. 1 Davis, Tr. 5, Wm. Boyd Sur. R.U.

Atascosa County

L. G. Priest No. 1 Bridwell, Tr. 45, Gorman Sur. Drlg. 1,113 ft.

Bastrop County

Marts & Beavers No. 1 Harris, McKean Sur. Drlg. 1,721 ft.

R. Pulliam No. 1 Yoast, Garcia Sur. R.U.

Bee County

Butler & Turner No. 1 Scott, Sec. 7, Howeth & Singer Sur., Uranga grant. Drlg. sh. 3,603 ft.

L. Glasscock No. 1 Ablinger, J. Ryan Sur Set sur. csg. 1,350 ft.; sd. 4,828-50 ft..

T.D. 5,945 ft.; blew out and controlled; C.P. 3,000 lbs.; sdtrkd. and drld. back in old hole; D.&A.

F. Shields No. 1 Harris, Blk. 4, Catlett & O'Neill Sur. Set surf. csg.; W.O.C.

R. B. Swiger No. 1 McKinney, L. C. Randolph Sur. Set sur. csg.; W.O.C.

Blanco County

E. L. Nixon No. 1 Hornberger, 1,200 ft. S line, 300 ft. E line, Sur. 723. Drlg. 913 ft.

Brooks County

Gifford Oil Co. No. 1 Singer, Sur. 630. Cg. 1,323 ft.

Lynway O. Co. No. 1 Singer, Blk. 9, Sur. 436. R.U.

Standard of Tex. No. 1 Mestina, Mestina Lse No. 3. Set csg. 3,968 ft.; drlg. plugs.

Burleson County

M. R. Exploration Co. No. 3 Fountain Wm. Raleigh Sur. M.I.M.

Red Bank Oil Co. No. 2 Grann, 6,063 ft. N line, 1,900 ft. W line, E. Santef Sur. M.I. rig.

Caldwell County

Crosby et al No. 1 fee, SW Lockhart Ed. L. sat. 1,843-47 ft.; set csg.

F. & W. Drlg. Co. No. 1 Rodenberg, J. Berry Sur. Set sur. csg.: W.O.C.

Housel Oil Co. No. 1 Driscoll. Drlg. 1,620 ft.

C. R. Richardson No. 1 Patterson, S. Pettus Sur. Drlg. 682 ft.

Sherman Nelson No. 1 Etheridge, T. Hunter Sur. T.D. 2,180 ft.; R.U.; W.O.O.

Cameron County

Ruez-Morton No. 1 United Land Irr. Co., Lot 7, Blk. 402, El. Jardin Subd. Loc.

Saxet Prod. Co. No. 1 Port Isabel Irr. Co. 600 ft. N line Loma Alta Lake, Sh. 2a Espiritu Santa Gr. Spudded and Stdg

Stapper Petroleum Corp. No. 1 Port Isabel Irrigation Co., Blk. 17, P.I.I.Co. Subd Santo Gr. Drlg. 7,726 ft.

DeWitt County

Caldaboard Oil Corp. No. 1 Afflerbach. 1,000-ac. tr. T.D. 4,260 ft.; resuming operations.

Dimmitt County

Wilcox O. & G. Co. No. 1 Light ranch, 330 ft. N and E line, sec. 67. Tstg. 5,643-86 ft.

Duval County

Geo. Viterio No. 1 E. E. Cadena, Blk. 6, Cadena Ranch Subd., Hinojosa Gr. Cg. 4,497 ft.

Edwards County

Auld, Dodson & Lyman No. 1 Rigsby, sec. 16. Drlg. 3,046 ft.

Frio County

Amerada Pet. Corp. No. 1 Harriman Flores Sur. 306. Lost hole; drlg. sdtrk. hole 2,147 ft.

Pagenkoff & Jamieson No. 2 Blackaller, Gourley Sur. 765. Loc.

Goliad County

Goliad Oil Corp. No. 1 Cole, 206 ft. W line, CN&SL, Lot 33, Goliad Town Trs. Blew out at 5,545 ft. T.D.; making gas through blowout preventer take off.

Guadalupe County

J. K. Blackman No. 1 McKay, Hodges Sur. Drlg. 2,659 ft.

J. K. Blackman No. 1 Appling, Hodges Sur. Drlg. 261 ft.

Byrd Oil Co. No. 1 Schueneman, G. Dewitt League. Cg. chalk.

J. E. Clark No. 1 Knodel, G. DeWitt Sur. Drk.

J. E. Clark No. 1 Schneider, J. Cantu Sur. Drk.

Louis Crouch No. 1 King, J. D. Clements Sur. R.U.

Fair et al No. 1 Hemple, Williams Sur. Drlg. 1,657 ft.

Lincoln Pet. Co. No. 1 Baenzinger, Mansola Sur. Set csg. 1,990 ft.; drlg. plugs.

Robertson et al No. 1 Blumberg, M. Baker Sur. Drlg. 1,026 ft.

Hidalgo County

Young & Bonneau No. 1 Diaz, Tr. 331, Porc. 40. Cg. sd. 3,107 ft.

Jim Hogg County

Cole Pet. Co. No. 1 Yeager, Sur. 452. Cg. 2,956 ft.

Nordan & Morris No. 1 Badger, SW¼ Sur. 640. Drlg. 1,863 ft.

Sheppell O. Co. No. 1 Thompson, Blk 2, Sh. 2, Las Animas Gr. R.U.

Jim Wells County

Magnolia Pet. Co. No. 7 Seeligson, 10,433 ac. tr., Los Jaboncillos Gr. Set csg. 996 ft.; W.O.C.

Roberts et al No. 1 Wade, Lot 2, Wade ranch. Loc.

Wellington Oil Co. No. 1 C. D. Sevier, 5,877 ft. E line, 5,525 ft. S line, Lola Gr. Drlg. 2,392 ft.

Live Oak County

R. A. David No. 1 Mac Bach, 423-ac. tr., Hays Sur. R.U.

Empire G. & F. Co. No. 1 Geo. West. Lot 107, Blk. "B," G. West Subd. D.&A. 3,059 ft.

Loma Oil Co. No. 1 Terrill, Houlihan Sur. Drk.

S. E. Wilson No. 1 Southwestern Life Ins. Co., NE¼, NW¼, Blk. 57, Simmons City Subd. Drlg. sh. 1,023 ft.

McMullen County

H. K. Boysen No. 1 Murphy, Murphy Sur. 480. D.&A. 2,354 ft.

Howell Oil Corp. No. 1 Martin, Sur. 213. Drlg. 1,907 ft.

Humble O. & R. Co. No. 4 Edrington, Sur. 63. D.&A. 2,769 ft.

E. M. Jones No. 3 Ezell, SE¼, sec. 3, Ezell ranch. Tstg. 1,265 ft.

Rowan & Hope No. 1 Rhodes, NE¼ sec. 18, Seale & Morris Sur. M.I.M.

Nueces County

Clarkwood Oil Co. No. 1 H. B. Baldwin, Blk. 11, Russell Farm Lots. Drlg. 6,422 ft.

Gillock et al No. 1 Poenisch, Lot 11 sec. 32. M.I.M.

L. Glasscock No. 1 Kansas Life. Ins. Co., 330 ft. N and W lines, sec. 196. D.&A. 6,050 ft.

Navarro Oil Co. No. 1 Poenisch, Lot 21, sec. 14. M.I.M.

Green River Oil Co. No. 1 Cassens, sec 26, Longorio Sur. Spudded.

H. P. R. Oil Co. No. 1 River Bros., 80-ac. tr., sec. 301, Bishop Subd. Loc.

Phillips Pet. Co. No. 1 Harney, Sh. 11, Gregoria Farias Gr. (W.O.). Old T.D. 4,279 ft.; drlg. 4,521 ft.

Seaboard Oil Corp. No. 1 James Luby, Blk. 4, Mary Luby Subd., Petronilla ranch. Drlg. 3,414 ft.

Southern Minerals Corp. No. 1 R. King, sec. 32, King Farm Lots. S.D.; T.D. 6,000 ft.

Taylor Pet. Co. No. 1 Stiles, Blk. 14, sec. 18, Petronilla ranch. Drlg. 3,477 ft.

San Patricio County

Conroe Drlg. Co. No. 1 Foley, SE¼, Blk. 42, Delmos Sur. Loc.

Wheelock & Collins No. 1 Willis, Lot 3, Gregory Farm Sur. T.D. 6,551 ft.; D.&A.

Starr County

Calderoni-James-Follette No. 1 Rodriguez, Blk. 6, Sh. 56, Porc. 80. Set sur. csg. 100 ft.; W.O.C.

Cook, Morris & Arnold No. 2 S.C.C.C., Blk. 23, Porc. 89. S.D. 1,980 ft.

Donroy Oil Co. No. 1 Ramon, 2,400 ft. SE line, 150 ft. SW line, sec. 150. Cg. 1,281 ft.

Henry Mode et al No. 1 Kelsey-Bass, Blk. 7, Porcs. 86 and 87. S.D. 630 ft.

Schwab & Foster No. 1 Munoz, 1,478-ac. tr., El Javali Gr. Drlg. 1,523 ft.

Transwestern Oil Co. No. 2 Slick, 330 ft. N and E lines, sec. 527. T.D. 5,659 ft.; drlg. sdtrkd. hole 4,943 ft.

Webb County

Bolling & Coffey No. 1 South Texas C. Co., Sur. 768. Cg. 1,898 ft.

C. H. Brady No. 1 Garcia, Sur. 786. Loc.

Eugene Garner No. 2 Saldivar, Blk. 12. Sur. 567. Oil sd. 997-1,000 ft.; set csg.; W.O.C.

J. W. Magee No. 1 Garcia, Blk. 21, James Subd. R.U.

Paul Meaders No. 1 Garcia, Sur. 338. Loc.

L. Purnell No. 1 Rosa Benavides, Surs. 677 and 721. D.&A. 3,508 ft.

F. M. Shaver No. 1 Trafton, Sur. 281. R.U.

Willacy County

Ruez-Morton, Inc., No. 1 F. Armendiaz, C Lot 9, Sh. 4, San Juan de Carricitos Gr. Drlg. 537 ft.

Ruez-Morton, Inc., No. 1 Johnson-Stillman, Lot 14, Blk. 25, Sh. 44, San Juan de Carricitos Gr. S.D. 643 ft.

Wilson County

Maryland Oil Co. No. 1 Rice, 93-ac. tr., Mays Sur. Drlg. 1,528 ft.

Zapata County

H. Guinn Lewis No. 1 S. Benavides, Blk. 39, Villa Gr. Cg. 2,059 ft.

Lewis Prod. Co. No. 1 Martinez, Blk. 123. D.&A. 2,259 ft.

Lundell Prod. Corp. No. 1 Ramirez, Sh. 1, Porc. 18. D.&A. 2,508 ft.

Westheimer & Daube No. 1 Lopez, Sur. 288. Drlg. 1,265 ft.

Zavalla County

Wilcox O. & G. Co. No. 1 Gillman, sec. 11. Set csg. 3,930 ft.; flwd. 75 B.P.H. and small amt. gas; rng. tbg.

S. W. TEXAS PROVEN

McCampbell—Aransas-San Patricio Counties

Atlantic Ref. Co. No. 2 Maryland Trust Co., 330 ft. N and E lines. Blk. 23. Set csg. 6,516 ft.; T.D., sh. 6,552½ ft.; jetting S.W. and oil; (fluid 95% S.W. and 5% oil).

Atlantic Ref. Co. No. 1-E Murray, Lots 3 and 4, sec. 38. Sd. 6,536½-48 ft.; comp.; 73 B.P.D. on ⅞-in. ck.; perf. csg. 6,543-46 ft.

Atlantic Ref. Co. No. 1-B Murray, Lot 16, Blk. 12. Drlg. 1,987 ft.

Atlantic Ref. Co. No. 1 Porterfield, Lots 9 and 10, Blk. 14. Drlg. 1,750 ft.

Buckingham Oil Co. No. 7-A McCampbell, C E½, Lot 5, Blk. 42. Drlg. 6,512 ft.

Buckingham Oil Co. No. 3-B McCampbell, Blk. 40. Oil sd. 6,535-43 ft.; set csg. 6,551½ ft.; W.O.C.

Eleanor Oil Co. No. 1-A McCampbell, Blk. 58. Drlg. 5,456 ft.

Landreth Prod. Co. No. 1 McCampbell, Lot 4, Blk. 40. Cg. 7,087 ft.

Plummer—Bee County

Ann Oil Co. No. 2 Smith, J. R. Johnson Sur. Drlg. 230 ft.

West Tuleta—Bee County

Saltdome Oil Co. No. 1 Striebeck, Blk. 3, sec. 20, Uranga Gr. Spdd.

Von Ormy—Bexar County

J. Beard No. 4 Barragan, Simpson Sur. Comp.; 5 B.P.D.; T.D. 665 ft.

Shadrock Oil Co. No. 10 Barragan, J. Simpson Sur. Drlg. 472 ft.

Alta Mesa—Brooks County

Standard of Texas No. 5 Mestina, Lease No. 1. Cg. ahead 3,750 ft.

Standard of Texas No. 6 Mestina, Lse. No. 1. Set csg. 2,990 ft.; W.O.C.

Alta Verde—Brooks County

Wyrick Well Sur., Inc., No. 1 Singer, Sur. 436. R.U.

Luling-Branyon—Caldwell County

Fred Adams No. 8 Ellison, D. Cooper Sur. M.I.M.

Belcher No. 1 Fulcher. Set surf. csg.; W. O.C.

Blundell Oil Co. No. 3 Luce, J. Neill Sur. Set csg. 56 ft.; W.O.C.

Chiquita Oil Co. No. 5 Robertson, Neill Sur. R.U.

Easton & Manning No. 5 Lawler, J. Pinchback Sur. R.U.

Goode & Mayton No. 2 McConnell. Comp.; no gauge; T.D. 2,228 ft.

Lanning & Coffield No. 1 Corder. T.D. Buda 2,179 ft.; comp.; 720 B.P.D.

Lanning & Coffield No. 2 Corder, J. A. Neill Sur. Drlg. 250 ft.

Magnolia Pet. Co. No. 1 Tiller, Henry Sur. R.U.

R. Mallory No. 1 Browne, Miller Sur. Set csg. 1,925 ft.; W.O.C.

Memphis Nat. Gas Co. No. 2 Young, Miller Sur. Comp.; 40 B.P.H.; ½-in. ck.

Sherman Nelson No. 2 Branyon, D. Cooper Sur. Drlg. 2,073 ft.

Sherman Nelson No. 1 Clark, Tiller Sur. Drk.

Wm. Swearingen No. 1 Best, J. Neill Sur. T.D. 2,405 ft.; comp.; no gauge.

Taylor Ref. Co. No. 1 Branyon, D. Cooper Sur. Comp.; 115 B.P.D.; T.D. 2,150 ft.

Taylor Ref. Co. No. 2 Branyon, D. Cooper Sur. Comp.; no gauge; T.D. 2,334 ft.

Taylor Ref. Co. No. 4-B Branyon, D. Cooper Sur. Drlg. 56 ft.

S. M. Vaughy No. 5 Flowers, Neill Sur. Drlg. 1,179 ft.

R. Wyrick et al No. 2 Magee, Neil Sur. R.U.

Buchanan—Caldwell County

Easton & Manning No. 2 Cude, Spillars Sur. R.U.

L. G. Priest No. 1 Chambless, S. Goodman Sur. R.U.

Texas Gulf Pet. Co. No. 1 Medlin, Camon Sur. R.U.

Dunlap—Caldwell County

Kay Oil Co. No. 1 Dunlap, S. Seale Sur. Chalk 1,928-2,036 ft.; set csg.; W.O.C.

Crouch Oil Co. No. 4 Starke, Seale Sur. Comp.; 60 B.P.D.; T.D. 1,262 ft.

Stapper Pet. Corp. No. 1 Martin, A. Floyd Sur. R.U.

Salt Flat—Caldwell County

Chiquita Oil Co. No. 4 Hickman, G. Hinds Sur. Comp.; 120 B.P.D.; T.D. 2,629 ft.

Chiquita Oil Co. No. 5 Hickman, G. Hinds Sur. R.U.

H. A. Pagenkopf No. 1 Hanson, J. Hinds Sur. Top Edws. 2,645 ft.; T.D. 2,648 ft.; completing.

Charamousca—Duval County

N. V. Duncan No. 8 Worden & Draught, Sur. 151. Sd. 1,531-40 ft.; comp.; 50 B. P.D. on pmp.

Colmena—Duval County

Conservative Oil Co. No. 6 D.C.R.C., Blk. 12, Sur. 51. Sd. 1,442-48 ft.; set csg.; W.O.C.

Wellington Oil Co. No. 5 D.C.R.C., Blk. 10, sec. 51. R.U.

Driscoll—Duval County

Continental Oil Co. No. 15-A Driscoll, sec. 448. Drlg. 1,287 ft.

Government Wells—Duval County

Magnolia Pet. Co. No. 19 Wilson, Sur. 134. Set csg. 2,428 ft.; comp.; 20 B.P.D.

Hoffman—Duval County

Relience Oil & Roy. Co. No. 2 Ruiz, Sur. 125. Drlg. 1,753 ft.

Kohler—Duval County

Bunn Bros. & Coates No. 5-B Peters, 81-ac. tr., sec. 29. Sd. 1,825-27 ft.; tstd. gas; sd. 1,829-35 ft.; odor oil and gas; set csg.; W.O.C.

Chiquita Oil Co. No. 1 Peters, 162-ac. tr., Sur. 162. Stdg. with csg. set 100 ft.

Humble O. & R. Co. No. 59-A Kohler, Sur. 164. Drlg. sh. 3,535 ft.

Windsor Oil Co. No. 5-B Peters, Sur. 34. Loc.

Labbe—Duval County

Humble O. & R. Co. No. 2 Ross, sec. 119. Set csg. on sd. 2,855 ft.; W.O.C.

Magnolia Pet. Co. No. 4 Labbee ranch, Sur. 1. Sd. 2,458-66 ft.; tstg.

Loma Novia—Duval County

F. J. Gravis No. 4 Hahl, Sur. 64. R.U.

Humble O. & R. Co. No. 16 Vela, sec. 42. Drlg. sd. 2,711 ft.

Humble O. & R. Co. No. 2-C Wilder, sec. 73 (W.O.). Old T.D. 2,734 ft.; T.D. 3,001 ft.; D.&A.

Magnolia Pet. Co. No. 15 Herbst, sec. 70. Set csg. 2,764 ft.; tstg.

Texas Co. No. 26 Bishop, Sur. 57. T.D. 2,574 ft.; comp.; 142 B.P.D.

Texas Co. No. 5-B Ruiz, sec. 41. Set 7-in. csg. 2,571 ft.; T.D. 2,579 ft.; R.U. to pmp.

Lopez—Webb-Duval Counties

W. C. Billings No. 3 fee, Sur. 2. Sd. 2,310-13 ft.; W.O. pmp.

W. C. Billings No. 4 fee, Sur. 2. Set sur. csg.; W.O.C.

Glen Harroun No. 3 Lopez, Sur. 110. Comp.; 16 B.P.H.; T.D. 2,261 ft.

Kepley Prod. Co. No. 1 Billings, NW¼, Sur. 6. T.D. 2,303 ft.; D.&A.

Mortimer & Springer No. 16-B Lopez, Sur. 112. Comp.; 16 B.P.H. on ½-in. ck.; sd. 2,229-50 ft.

Superior Oil Co. No. 21 Billings, Sur. 109. Sd. 2,288-99 ft.; completing.

Superior Oil Co. No. 22 Billings, Sur. 109. Sd. 2,278-83 ft.; set csg.; W.O.C.

North Sweden—Duval County

Argo Oil Co. No. 1 Carrillo, NE¼, sec. 9. R.U.

Arkansas Fuel Oil Co. No. 1 Vaello Puig, 330 ft. N and E line, sec. 10, Sweden Farm Lots. M.I.M.

Benedum & Trees Oil Co. No. 1 Puig, 330 ft. N and W lines, 750-ac. tr., San Andres Gr. Sd. 4,743-52 ft.; tstg.

Frank Gravis No. 2 Vaello Puig, 990 ft. S line, 330 ft. W line lse., San Andres Gr. Drlg. 3,633 ft.

Highland Oil Co. No. 1 Farrias, Sweden Farm Lots. Sd. 4,795-4,804 ft.; drlg. plugs.

Parr Oil Co. No. 1 Vaello Puig, Sur. 24, S. Flores Gr. Cg. 4,762 ft.

Reynosa Oil Co. No. 1 Wilson, Blk. 9, Sweden Farm Lot. Drlg. 2,895 ft.

Smith & Storey No. 1 Smith, Blk. 9, Sweden Farm Lots. Drlg. 556 ft.

Palangana—Duval County

F. J. Gravis No. 2-A Schallert, Sur. 255. Set sur. csg.; W.O.C.

Penn Palangana Oil Co. No. 1 C. K. Gravis Sur. 250. Drlg. 3,327 ft.

Tuttle & Trahan No. 1 Megerle, Sur. 245. Drlg. 1,021 ft.

Piedra Lumbre—Duval County

Magnolia Pet. Co. No. 2 D.C.R.C., Sur. 203. Comp.; 56 B.P.D.; T.D. 1,978 ft.; sd. 1,963-75 ft.

Magnolia Pet. Co. No. 3 D.C.R.C., Sur. 203. Sd. 1,946-65 ft.; set csg.; W.O.C.

Texas Co. No. 23 D.C.R.C., SW¼, Sur. 100. Drlg. 467 ft.

Seven Sisters—Duval County

A. J. Brinkoeter No. 2 Garcia, Sur. 212. Sd. 2,655-65 ft.; comp.; 75 B.P.D.

A. J. Brinkoeter No. 2 Garcia, Sur. 212. Drlg. 1,527 ft.

Humble O. & R. Co. No. 15 Dowdy, sec. 272. Set csg. 2,578 ft.; W.O.C.

Sweden—Duval County

Hiawatha Oil Co. No. 2 Herberger, SW¼, Blk. 14, Agua Poquita Gr. T.D. 5,914 ft.; P.B. sd. 5,072-91 ft.; completing.

Thomas-Lockhart—Duval County

Thomas Est. & Lockhart Bros. No. 2 Parr SW¼, sec. 26. T.D. 4,904 ft.; P.B. and set csg. 4,680 ft.; W.O.C.

Pearsall—Frio County

Amerada Pet. Corp. No. 1 Halff & Oppenheimer (W.O.). Old T.D. 6,312 ft.; swbg. 6,314 ft.

Amerada Pet. Corp. No. 8 Halff & Oppenheimer, S. A. Ditch Sur. 1,104 (W.O.). Drlg. 9,850 ft.

Amerada Pet. Corp. No. 1 Kothman, B. L. Crouch Sur. (W.O.). Old T.D. 4,370 ft.; T.D. 5,559 ft.; tstg.

Amerada Pet. Corp. No. 4 Smith, Mason Sur. 322 (W.O.). Old T.D. 6,238 ft.; R.U.

Clark—Guadalupe County

J. E. Clark No. 1 Knodel, G. DeWitt Sur. R.U.

Diamond Halff Oil Co. No. 2 Larison, G. DeWitt Sur. Spudded.

Kenedy & Crowley No. 1 Johns, Davis Sur. T.D. 2,507 ft.; D.&A.

LaJita Corp. No. 4 Denman, Arrington Sur. Comp.; 98 B.P.D.; T.D. 2,463 ft.

Darst Creek—Guadalupe County

Freeman Oil Co. No. 3 Larrison, G. DeWitt Sur. T.D. 2,700 ft.; dry; P.B. 2,450 ft.; W.O.C.

Saxet Prod. Co. No. 2 Wilson, G. DeWitt Sur. No. 13. Drlg. plugs in chalk.

V. G. Schimmel No. 1 Snyder, J. Cantu Sur. T.D. 2,036 ft.; completing.

Nolte—Guadalupe County

Riddle Oil Co. No. 2 Nolte, Lowell Sur. 16. D.&A. 1,957 ft.

Zoboroski—Guadalupe County

Louis Crouch No. 1 King, Clements Sur. Drlg. sh. 1,923 ft.

Donan et al No. 1 State, 30-ac. tr., on bank Guad. River. Set csg. 2,159 ft.; prep. test 2,214 ft.

Felmont Oil Co. No. 1 Schueneman, G. DeWitt Sur. Cg. chlk. 2,317 ft.

Ogden & Reed No. 1 Hoffman, G. DeWitt Sur. Drlg. 2,317 ft.

Samfordyce—Hidalgo-Starr Counties

Dean Bros. No. 1-C George, 20-ac. tr., Sh. 93, Porc. 41. R.U.

Ralph E. Fair, Inc. No. 4 Flores, 30-ac. tr., Tr. 250, Porc. 38. S.D.; repairs; 2,827½ ft.

Ralph E. Fair No. 1-A Pena, 20-ac. tr., Sh. 250, Porc. 38. Comp.; 120 B.P.D. on ¼-in. ck.

Armagosa—Jim Hogg County

Texmalis & Reese No. 1 Earhart, John Suggs Sur. T.D. 4,000 ft.; S.D.; W.O.O.

Bentonville—Jim Wells County

Camp Prod. No. 1 Bird, Sh. 7-A, Abajo Gr. Drlg. 3,919 ft.

Camp. Prod. Co. No. 2-B Pope, N½, sec. 13, King Farm Lots. M.I.M.

Texon Drlg. Co. No. 2 Ralston, 990 ft. N line, 330 ft. W line, sec. 17. R.U.

Sandia—Jim Wells County

Geo. E. Smith No. 1 Wade ranch, Lot 1, Blk. "B," Bode Subd. Drlg. 5,031 ft.

Goe. E. Smith Drlg. Co. No. 2 Wade ranch, Lot 1, Blk. "B," Bode Subd. Set csg. 298 ft.; W.O.C.

West Premont—Jim Wells County

C. G. Glasscock No. 2 Ritter, Lot 36, sec. 76. Squeeze job 2,250 ft.

Graham & Gilcrease No. 2-A Laughlin, C Lots 23 and 26, sec. 76. Recomp.; gas and dist. prod. 2,250 ft.; killing to rework.
Graham & Gilcrease Oil Co. No. 2-B Laughlin, sec. 77. Drlg. new hole.
Graham & Gilcrease No. 4 Laughlin. Lots 94 and 99, sec. 77. R.U.
Henshaw Bros. No. 1 McGuffin, W½, sec. 230. R.U.
Homer Presnall No. 1 Heron, Lots 22 and 27, sec. 72. R.U.
Smith & Storey No. 1 Buldue, Lots 5 and 12, Sec. 76. Set sur. csg.; W.O.C.
Trio Oil Co. No. 1 Laughlin, Lots 33 and 48, sec. 77. Skdg. on.
Trio Oil Co. No. 1 Thirkell, Lots 50 and 63, sec. 77. Comp.; 70 B.P.D.; ⅝-in. ck.; sd. 2,243-55 ft.
Weinert et al No. 2 Thirkwell, Lots 50 and 63, Sec. 77. R.U.

North Petus—Karnes County

Magnolia Pet. Co. No. 14 Porter, Morris Sur. Sd. 3,658-66 ft.; set csg. 3,658 ft.; bailing.

Kingsville—Kleberg County

Humble O. & R. Co. No. 9 Kleberg, Lot 2, sec. 40. Sd. 3,218-28 ft.; D.S.T. rec. 210 ft. oil, 200 ft. oily mud; W.P. 54 lbs. in 24 min.; rmg. sd. 3,235 ft.

Oakville—Live Oak County

Ohio Fuel Oil Co. No. 2 Rosebrock, L. Romero Sur. T.D. 2,745 ft.; blew out, running wild, making gas from sd. at est. 2,108-12 ft.; shut in; D.&A.

Jacob—McMullen County

Loma Oil Co. No. 5-B Jacob, Sur. 15. Comp.; 10 B.P.D.; sd. 1,028-52 ft.
Loma Oil Co. No. 7-B Jacob, Sur. 15. R.U.

Loma Alta—McMullen County

J. T. Lanier No. 1 Hagist, SE¼, N½, Sur. 481. Drlg. 927 ft.

North Jacob—McMullen County

F. D. Salter No. 2 Griffith, Osborn Sur. Drlg. 365 ft.

South Cailliham—McMullen County

D-Sel Oil Co. No. 1 Claunch, M. Hely Sur. Loc.

Agua Dulce—Nueces County

United Prod. Co. No. 1 Harvey, 1,100 ft. W line, 1,050 ft. N line, tr., M. Garza Sur. Set 5½-in. csg. 7,457 ft.; perf. csg. 7,375-84 ft.; flwg. 112 B.P.D. fluid, reported 25 to 30% oil, remainder S.W.; T.D. 9,003 ft.; cleaning on ⅛-in. ck.; T.P. 2,700 lbs.; C.P. 3,260 lbs.; reworking; recond. mud.

Chapman Ranch—Nueces County

Seaboard Oil Corp. No. 5 Chapman, sec. 38, Laurells Farm Lots. Drlg. 3,471 ft.

Clara Driscoll—Nueces County

Magnolia Pet. Co. No. 3 Sevier, 80-ac. tr., Russell Sur. Set csg. 3,877 ft.; comp.; 135 B.P.D. on ¼-in. ck.; sd. 3,878-80 ft.

Flour Bluff—Nueces County

Humble O. & R. Co. No. 1 Brown, Blk. 28, sec. 48. Drlg. sh. 6,511 ft.
Humble O. & R. Co. et al No. 1 Downie, Lot 18, Blk. 48. Drlg. sh. 1,073 ft.
Humble O. & R. Co. et al No. 1 Dunn, Lot 6, Blk. 41. Set csg. 6,663 ft.
Humble O. & R. Co. No. 5 Gulden, Lot 15, Blk. 47. Drlg. sh. and L. 3,615 ft.
Humble O. & R. Co. et al No. 5-A Miller, Lot 18, Blk. 56. Sd. 6,621-55 ft.; comp.; 182.16 B.P.D. on ⅛-in. ck.
Humble O. & R. Co. et al No. 5-B Miller, Lot 19, Blk. 48. Cg. sd. 6,653 ft.
Humble O. & R. Co. No. 1 F. G. and Kate Ritter, Lot 15, Blk. 55. Drlg. sh. 2,247 ft.
Humble O. & R. Co. No. 3 Robertson, Lot 11, Blk. 56. Drlg. sh. 2,817 ft.
Humble O. & R. Co. No. 1 Thompson, Lot 10, Blk. 55. Set csg. 6,647 ft.; comp.; 178 B.P.D. on ¼-in. ck.; sd. 6,627-67 ft.
Humble O. & R. Co. et al No. 5 Webb, Lot 10, Blk. 56. Drlg. hd. sdy. sh. 4,667 ft.

London—Nueces County

Atlantic Ref. Co. No. 1 Stockton, SW¼, sec. 12. Loc.
Cosner & Cosner No. 2 Stockton, 40-ac. tr., sec. 25. Sd. 4,898-4,907 ft.; comp.; gasser; T.P. 1,925 lbs. on ¼-in. ck.

Saxet Heights—Nueces County

Wm. Brady No. 1 Whelan, 56.9-ac. tr., Villareal Sur. Set sur. csg.; W.O.C.
Genro Drlg. Co. No. 1 Owens, Villareal Sur. Sd. 4,049-74 ft.; set 7-in. csg. 4,074 ft.; W.O.C.
Harrison Drlg. Co. No. 1 Simms, 4-ac. tr., Villareal Sur. T.D. 4,097 ft.; P.B. and sdtrkd. 3,928 ft.; set csg. in sdtrkd. hole 4,098 ft.; stdg.
H. M. Reed No. 2 Quinn, 28-ac. tr., Villareal Sur. Drlg. 557 ft.
Roosth & Genecov No. 1 Rose, Lot 9, Blk. 11, Villa Gardens. R.U.
Ben F. Smith No. 1 Snowden, 13-ac. tr., Villareal Sur. R.U.
Taylor Pet. Corp. No. 2 Kaler, 10-ac. tr., Villareal Sur. Perf. 4,080-86 ft.; T.D. 5,146 ft.; comp.; est. 25 B.P.D. on ½-in. ck.

Saxet—Nueces County

Allen & Morris No. 1-B Solar Sevier, Villareal Sur. Drlg. 4,483 ft.
C. Andrade No. 9 McGregor-Belk, 130 ft. S line, 990 ft. E line, lse., Sur. 816. Drlg. 4,577 ft.
Baltic Drlg. Co. No. 5 Harmon, Sur. 416. Drlg. 6,021 ft.
R. B. Bryant No. 2 Frank, Sh. "C," Sur. 416 (W.O.). R.U.
Conservative Oil Co. No. 3-B Morgan, Sur. 403. Oil sd. 6,914-28 ft.; set csg. 6,928 ft.; perf. 6,750 ft.; S.W.; perf. 4,048-52 ft.; S.D.; R.U. to rework.
Crown Central Pet. Corp. No. 4 Hunter, 159-ac. tr., Sur. 587. Drlg. 3,815 ft.
Crown Central Pet. Corp. No. 4 Page, 75-ac. tr., Page Lds. Sur. Drlg. 1,200 ft.
Donico Prod. Co. No. 4 Donigan, 60-ac. tr., Villareal Sur. Comp.; 330 B.P.D. on ¼-in. ck.; sd. 4,060-4,910 ft.
Floboots Oil Co. No. 1 Bliss, 25-ac. tr., Stevens Tr. Drlg. 5,115 ft.
Floboots Oil Co. No. 4 Humphries, Stevens Sur. W.O.; old T.D. 5,840 ft.; R.U. to D.D.
Gilcrease Oil Co. No. 3 Sullivan, 140-ac. tr., Thos. Gallagher Sur. S.D. 3,852 ft.; W.O.O.
L. Glasscock No. 2 Johns, 20-ac. tr., MacGregor Sur. 582. M.I.M.
Great States and Violet No. 9 McGregor-Belk, 73.6-ac. tr., sec. 311. Cg. 6,323 ft.
Hiawatha Oil Co. No. 7 Griffith, 100-ac. tr., Sur. 416. Drlg. 4,927 ft.
Hiawatha Oil Co. No. 8 Hutchins-Stillwell, Lot 30, Sheppard Farm Lds. Sd. 6,888-7,004 ft.; perf. 6,927-32 ft.; rng. tbg.
Hiawatha Oil Co. No. 9 Hutchins-Stillwell, Lot 34, Sheppard Lds. Sd. 6,542-58 ft.; perf. csg. 6,729-34 ft.; completing.
Hiawatha Oil Co. No. 3-B Smith, Blk. 35, Sheppard Farm Lots. Drlg. 2,316 ft.
Hiawatha Oil Co. No. 5-B Smith, Blk. 35, Sheppard Farm Lots. Sd. 5,792-5,840 ft.; set csg. 5,840 ft.; W.O.C.
Houston Oil Co. No. 9 McGregor, 135-ac. tr., Sur. 582. Cg. sh. 6,692 ft.
Houston Oil Co. No. 23 Morgan, sec. 7, Rge. 5. Drlg. plug 4,425 ft.; completing.
Houston Oil Co. No. 24 Morgan, sec. 7, Rge. 5. T.D. 4,424 ft.; rng. tbg.
H. H. Howell No. 4 Hutchins, 80-ac. tr., Sur. 416. T.D. 7,505 ft.; set csg. 6,798 ft.; tstd. S.W.; P.B. 5,800-ft. sd.
H. H. Howell No. 3 Morgan, sec. 415. Drlg. 6,147 ft.
Kepley Prod. Co. No. 4 Donigan, 100-ac. tr., sec. 7, Rge. 6. R.U.
Morgan & Chapman Minerals Corp. No. 7 Morgan, NE¼, Sur. 405. Drlg. 2,697 ft.
Pan American Prod. Co. No. 6-D Morgan, Sur. 405. Sd. 6,898-6,908 ft.; set csg. 6,908 ft.; comp.; 109 B.P.D. on 5/32-in. ck.
Pan American Prod. Co. No. 6-B Sagarin, 82-ac. tr., Sur. 500. Drlg. 5,365 ft.
Pan American Prod. Co. No. 1-A Solar Sevier Sur. 582. Drlg. 6,023 ft.
Phillips Pet. Co. No. 1 Frank, 27.5-ac. tr., Sur. 500. Drlg. 5,310 ft.
Port O. & G. Co. No. 3 Cox & Cryder. Sd. 3,814-28 ft.; set csg. 3,851 ft.; swbg.
Potter & Snowden No. 1 Kocurek, 26-ac. tr., Smith Sur. 25. Drlg. 2,817 ft.
Potter & Snowden No. 1 Taggert, Blk. 5, Sur. 401. Drlg. 4,547 ft.
Renwar & Maryland No. 1-A Rand Morgan, Sur. 415. O.W.W.O.; R.U. to deepen; old T.D. 5,825 ft.
Republic Nat. Gas Co. No. 5-A Donigan, 240-ac. tr., secs. 6 and 7, Rge. 6. Set csg. 4,600 ft.; W.O.C.
Republic Nat. Gas Co. No. 19 Dunn, Blk. 37, Sheppard Farm Lots. Drlg. 3,912 ft.
Republic Nat. Gas Co. No. 3-A Morgan, sec. 405. Drlg. 1,780 ft.
Richardson Pet. Co. No. 18 Cain & Secrist, Lot 23, Russell Farm Trs. Sd. 4,-449-57 ft.; tstg.
Richardson Pet. Co. No. 5 Sedwick, Sur. 311. Set csg. 4,815 ft.; W.O.C.; T.D. 4,-902 ft.
Richardson Pet. Co. No. 9 Quiros, Blk. 36, Sheppard Lots. Drlg. 5,121 ft.
Sancor Oil Co. No. 1 Isensee, Blk. 12, Sheppard Farm Lots, Sur. 313. Set sur. csg. 968 ft.
Shell Pet. Corp. No. 4 Fiato, Blk. 4, Sheppard Farm Trs. Drlg. 2,427 ft.
Southern Minerals Corp. No. 20 Bliss, 120-ac. tr., Sur. 416. Sd. 6,717-28 ft.; cleaning in pits.
Southern Minerals Corp. No. 2 Stillwell, 60-ac. tr., 122-ac. tr., Sur. 311. R.U.
Texon Drlg. Co. No. 6 Kocurek, Sur. 316. Sd. 4,429-38 ft.; set csg.; completing.
Texon Drlg. Co. No. 6 Ocker, 200 ac. tr., Ward Surs. 402 and 316. Oil sd. 4,430-37½ ft.; set csg.; comp.; no gauge.

Sullivan—Nueces County

Lockhart et al No. 1 O. Purl, Lot 2, sec. 7, Ross Peters Subd. No. 2. Drlg. 2,-039 ft.

Midway—San Patricio County

Phillips Pet. Co. No. 1 Ivey, 990 ft. E line, 344 ft. S line, sec. K. Drlg. 1,727 ft.

Plymouth—San Patricio County

Heep Oil Corp. No. 7-E Welder, R. Montgomery Sur. Drlg. 4,517 ft.
Humble O. & R. Co. No. 2 Blaschke & May, Lot 8, sec. 25, Fourth Addn. Set csg. 5,652 ft.; flwg. into tanks; no gauge.
Plymouth Oil Co. No. 74-C Welder, sec. 71. Sd. 5,458-72 ft.; set csg.; W.O.C.
Plymouth Oil Co. No. 75-C Welder, sec. 70. Sd. 5,466-75 ft.; set csg.

Taft Field—San Patricio County

Esves Oil Co. No. 7 Britton, sec. 6. Cg. 4,937 ft.
Humble O. & R. Co. No. 23 Mayo, Ottman Sur. Drlg. sh. 2,864 ft.

Barbacoas—Starr County

K. E. Merren No. 1-A S.C.C.C., Blk. 34, Lambeth Subd., Porc. 89. Set csg. 5,353 ft.; cg. sdy. sh. 5,395 ft.

Cuevitas—Starr County

Sun Oil Co. No. 9-B Guerra, 330 ft. S and E lines, B Lse., Cuevitas Gr. Cg. 1,721 ft.

Los Olmos—Starr County

R. A. Mitchell No. 1 Kelsey-Bass, Blk. 6, Sh. 8, Porc. 76. Oil sd. 334-36 ft.; comp. on pmp.; 5 B.P.D.

Margo—Starr County

Dolgener et al No. 1 Garcia, 10-ac. tr., Sh. 7-B, Porc. 71. Cg. sd. 411 ft.

Ricaby—Starr County

Moss & Heard No. 2 Ricaby, Porc. 83. (W.O.). S.D. 2,032 ft.

South Ricaby—Starr County

G. E. Dodd, Tr., No. 2 Wood Est., Porc. 84. D.&A. 1,730 ft.
G. E. Dodd, Tr., No. 2-A Wood Est., Porc. 84. Drlg. 1,021 ft.

Rio Grande City—Starr County

Clopton & Reed No. 1 Green, Porc. 80. T.D. 4,600 ft.; S.G.; P.B. 1,681 ft.; set csg.; W.O.C.
Clopton & Reed No. 4 Tijerina, Lot 12, Sh. 14-C, Porc. 80. Cg. 1,423 ft.

Cole—Webb County

Highland Oil Co. No. 1 Bruni, Surs. 7 and 8. Sd. 3,422-34 ft.
O. W. Killam No. 52 Bruni, Blk. 20, Sur. 8. Set csg. 3,421 ft.; drlg. plugs.

Killam—Webb County

C. H. Bailey No. 1 Garcia, Sur. 333. Sd. 2,037-40 ft.; comp.; 60 B.P.D.
Hamill & Smith No. 2 Garcia, sec. 1,099. Sd. 2,000-05 ft.; comp.; gasser; T.D. 2,-016 ft.
R. Killam No. 2 Garcia, Sur. 1,099. R.U.
O. W. Killam No. 2 Garcia, Sur. 1099. Sd. 2,004-10 ft.; tstd. gas; rmg. to core deeper.
O. W. Killam No. 2 Laurel Bros., Blk. 28, sec. 333. Drlg. 510 ft.

O'Hern—Webb County

Hamill & Smith No. 6-A Benavides, Hale Subd. D.&A. 3,000 ft.
Magnolia Pet. Co. No. 26 Benavides, Blk. 26. Comp.; 75 B.P.D.; sd. 2,862-74 ft.
Magnolia Pet. Co. No. 27 Benavides, Blk. 31. Set csg. 2,830 ft.; W.O.C.
Magnolia Pet. Co. No. 42 Benavides, Hale Subd. Sd. 3,412-17 ft.; comp.; 180 B.P.D.
J. J. O'Hern No. 4-C Benavides, Blk. 24. Sd. 2,810-15 ft.; comp.; 16 B.P.H. on ⅝-in. ck.
J. J. O'Hern No. 5-C Benavides. Drlg. 547 ft.
H. M. Reed No. 4 Benavides, Blk. 299, Hale Subd. Swbg. 2,916 ft.
Starr Dev. Co. No. 1 Benavides, 330 ft. N and W lines, Sur. 173. M.I.M.
Sun Oil Co. No. 11-B Benavides, Blk. 444. Sd. 2,946-49 ft.; comp. on pmp.; no gauge.

LaSal Vieja—Willacy County

Shell Pet. Corp. No. 1 Yturria, Sh. 64, Carricitos Gr. (W.O.); set csg. 7,630 ft.; drlg. sd. 9,827 ft.

Byersville—Williamson County

Taylor Ref. Co. No. 9-B Heap, H. White Sur. R.U.

Cuellar—Zapata County

Magnolia Pet. Co. No. 4 Cuellar, Sur. 245. Sd. 1,246-55 ft.; tested 750,000 ft. gas; shut in.
Magnolia Pet. Co. No. 5 Cuellar, Sur. 245. Set sur. csg.; W.O.C.

Escobas—Zapata County

Earl Calloway No. 13 Santos, Sh. 7, Fansler Part. D.&A. 1,389 ft.
Gilbreath Bros. No. 2 Bustamente, Sh. 10, Fansler Part. Tstg. 1,137 ft.
Matthews Drlg. Co. No. 13 Garcia, Sh. 3, Fansler Part. Drlg. 950 ft.
Nordan & Morris No. 7 Bustamente, Sh. 33, Fansler Part. Oil sd. 1,216-27 ft.; set csg.; W.O.C.
Nordan & Morris No. 8 Bustamente, Sh. 33, Fansler Part. Oil sd. 1,212-17 ft.; T. D. 1,226 ft.
Nordan & Morris No. 9 Bustamente, Sh. 33, Fansler Part. Drlg. 927 ft.
Nordan & Morris No. 18 Bustamente, Sh. 33, Fansler Part. Set csg. 1,202 ft.; W.O.C.
E. C. Reeves No. 2 Bustamente, Sh. 9, Fansler Part. Drlg. 127 ft.
Texas Co. No. 99 Jennings, Cerrito Blanco Gr. D.&A. 1,471 ft.
Texas Pipe & Supply Co. No. 3 Bustamente, Sh. 9, Fansler Part. R.U.
Texas Pipe & Supply Co. No. 4 Bustamente, Sh. 9, Fansler Part. R.U.
Texas Pipe & Supply Co. No. 5 Bustamente, Sh. 9, Fansler Part. Spdd.

Lopena—Zapata County

Dalport Oil Corp. No. 1 Vela, Porc. 20 T.D. 2,541 ft.; P.B. 2,448 ft.; set csg.; W.O.C.

E. C. TEXAS WILDCATS

Anderson County

American Liberty Oil Co. No. 1 G. E Gauge, Blackfoot area, B. Gilbert Sur. Top Paluxy 6,758 ft.; top Glen Rose 7,029 ft.; D.S.T. 9,205 ft.; gas and mud; no oil
Barnsdall Oil Co. No. 1 H. C. Swanson, R. Duty Sur., 10 mi. E of Palestine. Drlg. 2,400 ft.
Tide Water Oil Co. et al No. 7 Monnig, S. Sanchez Sur., deep test, Long Lake field. Coring 9,700 ft.

Angelina County

Ed Holman et al No. 1 J. E. Hawkins, Bradshaw Sur., S of Huntington. Testing 2,236 ft.

Bowie County

Ferguson & Hill No. 1 Breckenridge. Drlg. 5,718 ft.
Thompson & Jaffie No. 1 R. Rosalind J Milam Sur., 3 mi. SW of Redwater. Drlg. 6,718 ft.
Woodley & Bently No. 1 Lumpkin. Drlg. 3,524 ft.

Cherokee County

A. F. Richardson No. 1 F. P. O'Brien, G. S. Clapp Sur., 3 mi. NW of Rusk; 5,000-ft. test. Loc.
Stoco Oil Co. et al No. 1 E. B. Parks, J. T. Cook Sur., 4 mi. SW of Rusk. Drlg. 4,112 ft.

Falls County

H. H. Bell et al No. 1 A. Garrett, J. M. Sanches Sur. T.D. 1,244 ft.; 700 ft. oil in 15 hrs.; to deepen to Edwards.
E. B. Collard et al No. 1 P. Neikamp, 400 ft. from N and 700 ft. from W of 86-ac. tr., W. Hampton Sur., 3 mi. E of Lott. R.U.

Fannin County

Joiner-Owens No. 1 Dr. Grey, Alex Russell Sur., 4½ mi. W of Monktown. W.O.C. 173 ft.

Freestone County

C. F. Lytle No. 1 R. Simmons, 23-ac. tr., R. B. Loughbotham Sur., 1 mi. S of Wortham. S.D. 3,820 ft.
T. E. Rossiter No. 1 J. P. Fulton in J. P. Fulton Sur., 4½ mi. E of Doney. Loc.
Stroude et al No. 1 P. Mullens, R. D. Sloan Sur., 6 mi. NE of Fairfield. T.D. 341 ft.

Henderson County

Tide Water et al No. 1 McElreath & Suggett. Top Georgetown 4,990 ft.; top Paluxy 6,005 ft.; top Glenrose 6,270-80 rt.; S.D. 7,195 ft.; making 8 bbls. day; pipe cut at 7,102 ft.
Tide Water Assoc. et al No. 2-C McElreath & Suggett, W. P. Wyche Sur. Drk.

Hill County

A. N. Mabry No. 1 J. T. Jones, 1 mi. S of Mt. Calm, Graves Sur. S.D. 754 ft.

Hopkins County

J. Carpenter Oil Co. No. 1 Gillis, between Brashear and Cumby, W. A. Smith Sur. Drlg. 1,829 ft.
Hughes & Williams No. 1 fee, 6 mi. SE of Brashear, Agaton Caro Sur. Pecan 2,159-2,210 ft.; drlg. 3,466 ft.

Houston County

American Liberty Oil Co. No. 1 W. L. Moody, S. E. Parker Sur., 1½ mi. NW of Grapeland. Drlg. plug. 1,721 ft.

Hunt County

Stanolind O. & G. Co. No. 1 J. P. Hawks, R. Ragsdale Sur., near Campbell. Top Paluxy 4,383 ft.; top Glen Rose 4,815 ft.; drlg. 4,927 ft.
Texola Land Corp. No. 1 J. M. Goin, Jas. Merrick Sur., 2 mi. SW of Wolfe City. S.D. 40 ft.

Kaufman County

Scott & Woodside No. 1 W. and T. Nash, in J. Cortez Sur., 1 mi. E of Scurry. S.D. 2,510 ft.

Lamar County

Blackman & McGee No. 1 J. M. Duck, J. C. Lamb Sur., just NE of Powderly. Loc.

Limestone County

A. W. Phillips et al No. 1 E. M. Speight, M. Herrin Sur., 6½ mi. SE of Mexia. S.D. 3,695 ft.
Pure Oil Co. No. 16-T Kendrick, P. Varella Sur., Mexia field. Top Georgetown 3,365 ft.; set csg.; T.D. 3,434 ft.

Red River County

Roy I. Carter Drlg. Co. No. 1 J. A. Tutt, C 40-ac. tr. in D. Hart Sur., 2 mi. S of Avery. S.D. 410 ft.

Rusk County

Barnett Pet. Corp. No. 1 S. C. Sanford, W. A. Corder Sur., 10 mi. E of Mt. Enterprise. To spud.
J. Merrick et al No. 1 Tipps, T. Uzzell Sur. 6 mi. S of East Texas field. S.D. 110 ft.; W.O.C.

Smith County

T. W. Doswell et al No. 1 J. Allred, approx. 4,500 ft. from N and 5,000 ft. from W of B. Lafferty Sur., 3 mi. N of Troup. M.I.M.

Van Zandt County

Glenn et al No. 1 E. Core, H. Ball Sur., 3 mi. N of Edom. Drk.
Humble O. & R. Co. No. 1 L. K. Riggs, W. Daniels Sur. Skidded 100 ft. S; drlg. 414 ft.

EAST TEXAS

(Border Counties)

Cass County

Arkansas-Louisiana No. 1 George, Wm. R. Myers Sur. Tstg. 60,000,000 ft. gas; T.D. 5,980 ft.
Gulf Prod. Co. No. 1 W. T. Henry, H Owens Sur., NW cor. survey Drlg. 200 ft.
P. L. Hoffman No. 2 Davis, J. S. Smith Sur. Drlg. 1,800 ft.
Magnolia Pet. No. 3 W. M. Hall, Wilson Robinson Sur. Drk.
Magnolia Pet. No. 4 W. M. Hall, John N. Jackson Sur. Drlg. 4,340 ft.
Magnolia Pet. No. 5 W. M. Hall, John N. Jackson Sur. Drlg. 3,780 ft.
Magnolia No. 1 Hayer & Thatcher, Jacob Carsner Sur. P.B. to 5,965 ft.; tstg. and acid.
Magnolia Pet. No. 14 L. Haywood, P Evans Sur. 7-in. 5,932 ft.; T.D. 6,035 ft.; W.O.C.S.
Magnolia Pet. No. 15 L. Haywood, P Evans Sur. 7-in. 5,942 ft.; T.D. 6,003 ft.; W.O.C.S.

Magnolia Pet. No. 16 L. Haywood, P. Evans Sur. Drlg. 3,672 ft.
Magnolia Pet. No. 17 L. Haywood, P. Evans Sur. 7-in. 5,932 ft.; T.D. 6,050 ft.; W.O.C.S.
Magnolia Pet. Co. No. 18 L. Haywood, P. Evans Sur. Drlg. 3,105 ft.
Magnolia Pet. Co. No. 19 L. Haywood, P. Evans Sur. Drlg. 3,171 ft.
Magnolia Pet. Co. No. 20 L. Haywood, P. Evans Sur. M.I.M.
Magnolia Pet. Co. No. 21, L. Haywood, P. Evans Sur. Drk.
Magnolia Pet. Co. No. 22 L. Haywood, P. Evans Sur. Drlg. 3,255 ft.
R. W. Norton No. 5 Davis, H. Holbert Sur. Drlg. 1,806 ft.
R. W. Norton No. 1 L. E. Hardin, Dudley Gilleans Sur. Drlg. 2,776 ft.
R. W. Norton No. 6 Davis, H. Holbert Sur. 6-in. 5,998 ft.; T.D. 6,019 ft.; W. O.C.S.
Ohio Oil Co No. 13 R. P. Willis, S.F.I.W. Sur. No. 1263. Drlg. 5,465 ft.
J. G. Puterbaugh et al No. 1 Doorley, Calloway Davis Sur., 14 mi. N of Rodessa. Drlg. 6,125 ft.
W. G. Ray Drlg. Co. No. 1 Parker, G. Crowder Sur. Drlg. 2,290 ft.
Texas Co. No. 1 Chatten, Wm. R. Myers Sur. Drlg. 5,135 ft.
Texas Co. No. 8 McLeod, W. A. Elliott Sur. Tstg.; T.D. 6,111 ft.
Texas Co. No. 3 N. A. Rambo, Cass Cty. Sch. Ld. Sur. Drlg. 2,350 ft.
Texas Co. No. 4 N. A. Rambo, Cass Cty. Sch. Ld. Sur. Drlg. 2,250 ft.
N. K. Towns No. 1 Henry, H. Owens Sur. NW cor. Sur. Drlg. 2,150 ft.
United Gas No. 2 V. C. Bivens, J. Collom Sur. 9-in. cmtd. 2,214 ft.; W.O.C.S.
United Gas No. 1 Threwer, J. S. Smith Sur. 9-in. cmtd.; 2,080 ft.; W.O.C.S.
United Prod. No. 2 Allday, 87 ac. trk. Drk.
United Prod. No. 6 Baugus Unit, R. Trammel Sur. T.D. 6,035 ft.; rmg.
United Prod. No. 2 Belote, H. Holbert Sur. Drlg. 2,107 ft.
United Prod. No. 2 J. Q. Clements, Wm. B. Hughes Sur. T.D. 6,090 ft.; rmg.
United Prod. No. 1 W. W. Herner, J. S. Smith Sur., on 14-ac. tr. Drlg. 2,617 ft.
United Prod. Co. No. 1 Kate, Spell Unit C. C. Sch. Ld. Comp.; gauge 8,000,000 ft. gas; T.D. 5,640 ft.
United Prod. Co. No. 1 J. W. Land, R. Potter Sur. Cg. 7,247 ft.
United Prod. No. 1 M. R. Lennard, J. S. Smith Sur., on 17-ac. tr. Cg. 3,055 ft.

Harrison County

Geyer Oil Co. No. 2-B Vincent, Davenport Sur. T.D. 2,135 ft.; R.U. to D.D.

Marion County—Rodessa

Arkansas-Louisiana No. 1 C. C. Braden T. Hanson Sur. Drlg. 5,217 ft.
Arkansas-La. No. 1 Laura McIntosh, Edmondson Sur. P.B. from 6,925 ft. to 5,980 ft.
Hunter Co. No. 1 E. W. Fonda, A. D. S. Coy Sur. Comp.; flw. 14 B.P.H.; T.D. 6,094 ft.

Panola County

Danciger O. & R. No. 1 Tatum, A. Bissell Sur. Spudded and S.D.
R. H. Dearing & Sons No. 1 Wooten Est., W. Mann Sur. Set surf. pipe.
Glassell & Glassell No. 1 Pierce & Chesbro, Julia Soape Sur. Drlg. 1,410 ft.
Magnolia Pet. Co. No. 2 E. A. Hull, Thos. Applewhite Sur. T.D. 5,948 ft.; 9-in. at 5,948 ft.; W.O.C.S.

Shelby County

Wm. Redditt No. 1 Pickering Lbr. Co., SE cor. Stephens English Sur. S.D. 2,165 ft.; laying fuel line and prep. to D.D.
H. A. Stebbinger No. 1 Pickering Lbr. Co., on 160-ac. tr. in A. Hanson Sur. P.B. 5,126 ft. to 5,073 ft.; W.O.C.S.

NORTH TEXAS WILDCATS

Archer County

O. P. Darsey No. 1 J. T. Longley, sec. 1839, T.E.&L. Sur. Drlg. 800 ft.
S. & H. Drlg. Co. No. 1 C. A. Mangold, C. Wright Sur. Loc.
H. M. Tebay No. 1 Richardson, J. Scott Sur. T.D. 1,240 ft.; to shoot and acidize.

Clay County

L. T. Burns No. 1 Sanzenbacker, L. N. Sparks Sur. A-401. Drlg. 3,275 ft.
Foster Minerals Corp. No. 1 V. H. Yarbrough M. Lassiter Sur. A-288. Drlg. 1,082 ft.
Walter H. Gant No. 3 C. M. Worsham, H. &T.C. Sur., Blk. 4. 6⅝-in. 3,910 ft.; bailing hole.
Green Mt. Oil Co. No. 1 Staggs, sec. 34, A.C.S.L. Sur. S.D.O. 3,295 ft.

Collin County

F. Jones No. 1 Sherley, G. Morrison Sur. Drlg. 3,000 ft.

Cooke County

Denver P. & R. Co. No. 1 Solomon, W. G. Hunt Sur. A-493. Drlg. 3,000 ft.
V. E. Powell No. 1 D. B. Allred, G. DeLos Santos Sur. A-894. R.U.R.
Sparks & Russell No. 1 C. F. Bundy, P. P. Cary Sur. A-1239. 6⅝-in. 2,090 ft.; W.O.C.
Texas Co. No. 1 J. F. Marshall, A. Burns Sur. A-49. Drlg. 1,550 ft.

Denton County

California Ref. Co. No. 1 W. & S. Life Ins. Co., B.B.B.&C. Sur. A-783. Drlg. 1,090 ft.
Oil Finance No. 1 J. S. Gambill. Drlg. 2,285 ft.
Regan & Davis No. 1 Williams, M.E.P.&P. Sur. A-927. Cem. surf. pipe and W.O.C.

Foard County

O. P. Burnham No. 1 Ward, sec. 21, H.& T.C. Sur., Blk. 8. Spudded.

Grayson County

North Texas Oil Co. No. 1 A. M. Smith, et. M. Williamson Sur. A-1300. S.D.O. 370 ft.

Jack County

Cockburn & Harper No. 1 Clayton, W. H. Smith Sur. A-540. Drlg. 2,800 ft.
F. S. Freeland No. 1 R. E. Graves, S. Hazel Sur. A-258. R.U.C.T.
H. M. Leidecker No. 1 J. W. Padgett, E. Allbritton Sur. A-1890. Drlg. 2,970 ft.
H. B. Madden No. 1 J. L. Mask, sec. 2708, T.E.&L. Sur. Drlg. 1,395 ft.
H. S. Moss No. 1 Bloodworth, G. Thompson Sur. A-612. Drlg. 3,100 ft.
Panhandle Ref. Co. No. 1 M. K. Graham, I. Hughson Sur. A-286. 6⅝-in. 3,029 ft.; W.O.C.
Tebay & Leberman No. 1 S. E. and E. W. Rankin, J. P. Thompson Sur. Spud and S.D.
R. A. Westbrook No. 1 Worthington-Knox, B.B.B.&C. Sur. A-185. Drlg. 900 ft.

Knox County

Denver P. & R. Co. No. 1 Waggoner, sec. 90, H.&T.C. Sur., Blk. E. Drk.

Montague County

Benton & Holmes No. 4 Reed A, T. Robinson Sur. O.W.D.D.; B.O.S. 2,320-28 ft.; set 5-in. csg.; W.O.C.
Moss Holmes No. 1 I. N. Monroe, F. Secrest Sur. A-665. Drlg. 1,598 ft.
Lesh & McCall No. 1 Dodson, T. R. Jackson Sur. A-394. Drlg. 585 ft.
Montague Oil Co., Inc., No. 1 W. J. Bell, sec. 2,882, T.E.&L. Sur. Fsg. csg.; T.D. 4,210 ft.; 8¼-in. 3,904 ft. collapsed; rec. 8¼-in. with 1,400 sacks cement after reaming out collapsed pipe.
Selby O. & G. Co. No. 1 J. M. Batts, M. B. Tatum Sur. A-740. Drlg. 5,401 ft.
J. W. Sorrell et al No. 1 J. E. Walthall, S. H. Smith Sur. A-662. Drlg. 903 ft.
Ventex Investments, Ltd., No. 1 S. E. Bell, sec. 11, M.E.P.&P. Sur. Drlg. 3,282 ft.

Wichita County

Christie et al No. 1 Vanmeter, Blk. 35, K.W.V.F.L. Sur. Drlg. 3,700 ft.
Leo Oil Co. No. 1 Fonville, sec. 323, Waggoner Co. Sur. S.D.O. 1,950 ft.

Wilbarger County

King Oil Co. No. 1 Waggoner V, sec. 107, H.&T.C. Sur. U.R. 8¼-in. csg. 1,310 ft.
F. A. Lain No. 1 J. Coffee, sec. 44, H.&T.C. Sur. Drlg. 4,150 ft.
L. Webb No. 1 Waggoner, sec. 49, H.&T. C. Sur., Blk. 2. L.S.O. 2,406-28 ft.; tested wtr.; S.D.O.; recmtg. csg.

Wise County

Latex Oil Co. No. 1 C. R. Smith, J. Couch Sur. A-104. S.D.O. 2,165 ft.; derrick pulled in.

Young County

F. W. Bennett No. 1 T. E. Mathews, I. Hughson Sur. A-2162. Drlg. 3,970 ft.
F. W. Bennett No. 1 R. V. Tidwell, J. L. Blackwood Sur. A-1378. Drlg. 1,270 ft.
Collins & Fitzwater No. 1 J. G. Castleman, sec. 72, T.E.&L. Sur. S.D.O. 1,002 ft.
H. J. Cox No. 1 W. T. Donnell, J. M. Smith Sur., sec. 1-7-1879. S.D. 1,800 ft.
C. A. Lupton et al No. 1 Hall, B. R. Aiken Sur. A-2241. T.D. 4,250 ft. S.D.O.
Pitzer & West & Lion No. 1 Mrs. F. Wray, T.E.&L. Sur. 3411. Drlg. 4,275 ft.
T G. Shaw Oil Corp. No. 1 J. L. McLaren, sec. 6, B.B.B.&C. Sur. 9-29. Drlg. 2,400 ft.
Yorktex Pet. Co. No. 1 W. E. Steele, I.R.R. Sur. A-156. Drlg. 2,370 ft.
H. Zweifel No. 1 E. S. Graham, B.S.&F. Sur. A-44. Drlg. 475 ft.
H. Zweifel No. 1 R. D. Sewell, M. Case Sur. A-1402. Drlg. 2,172 ft.

WEST TEXAS WILDCATS

Andrews County

W. G. Blanchard et al No. 1 Cox, C SW sec. 4, Blk. A-30, P.S.L. Sur. M.I.M.
M. S. Forgeron et al No. 1 Lockhart & Brown, C NE¼ sec. 20, Blk. A-41, P.S.L. Sur. R.U.
Sinclair Prairie Oil Co. No. 1 Emma Cowden, sec. 11, Blk. 44, Twp. 2n, T.&P. Sur. Drlg. 2,333 ft.
G. F. Getty, Inc., No. 1 R. H. Lindley, sec. 8, Blk. A-46. T.D. 4,902 ft.; P.B. to 4,690 ft.; to put on pump.
Hargrove et al No. 1 Riordan, NW¼, sec. 10, Blk. A-44, P.S.L. Sur. Drlg. T. D. 1908 ft. Set pipe.
Humble O & R Co. 2 Walker, 990 ft. S & 330 ft. W, sec. 6, Blk. A-43, P.S.L. Sur. Cellar.
Landreth Prod. Co. No. 1 L. Jones, sec. 11, Blk. A-42, P.S.L. Sur. Drlg. 3,700 ft.

Bailey County

E. L. Wilson et al No. 1 Yellow House Land Co., Labour 4, Abner Taylor League 700. Drlg. 3,778 ft.; elev. 3,687 ft.

Brewster County

F. C. Dodson No. 1 Texas American Synd., sec. 66, Blk. 10, G.H.&S.A. Sur. S.D. 4,026 ft
Storey No. 1 Wilson, sec. 3, Blk. 212, T.& St.L. Sur. S.D. 2,175 ft.

Cochran County

Bond & Harrison No. 1 Cameron, Labour 1 League 85 Greer Co. School Lands. Reaming 4,515 ft.
Pete Wiggins et al No. 1 C. Slaughter Dean, C Lab. 26, League 92, Lipscomb Co. School Ld. Loc.

Coke County

H. E. Ogden et al No. 1 Rawlins. T.D. 515 ft.
Plymouth Oil Co. No. 1 Mrs. Mary Hanna, sec. 252, Blk. LA, H.&T.C. Sur., 1½ mi. SW of Blackwell. Drlg. 2,421 ft.

Crane County

Gulf Oil Corp. No. 2 McKnight, sec. 9, Blk. B-21. Drlg. 5,100 ft.

Crockett County

R. H. Henderson No. 1 C. B. Haun et al. Machine.
Superior Oil Co. of Calif. No. 1 J. S. Todd, C SE¼ sec. 55, Blk. UV, G.C.&S.F. Sur. Drlg. 4,900 ft.

Dawson County

E. L. Wilson No. 1 Scanlon. Loc.
E. L. Wilson et al No. 1 Texas Ld. & Mtg. Co., sec. 45, Blk. M, E.L.&R.R. Sur. Drlg. 4,501 ft.

Edwards County

Dan Auld et al No. 1 Rigsby, sec. 16, Blk. OK, G.C.&S.F. Sur., 15 mi. NE of Rock Springs. W.O.C. 3,082 ft.
A. P. Carter No. 1 F. D. Sweeten, 2,310 ft. S&E sec. 48, Blk. 2, B&B Sur. 1½ mi. E of Rock Springs. Loc.

Ector County

Shasta Oil Co. No. 1 K. Sands, 440 ft. N and E, sec. 32, Blk. 44, T.&P. Sur. Loc.

El Paso County

Tri-State Oil Co. No. 1 Kinkel. Drlg. 2,834 ft.

Fisher County

L. A. Daniels et al No. 1 J. J. Nickless. Drlg. 3,077 ft.
Martin & Brubaker No. 1 Brown, W. E. Richardson Sur., sec. 4, Blk. R, T.P. 3,192 ft.; S.D. 3,194 ft. Acidized. 700 ft. oil in hole. To retreat.
Southern Oil Co. No. 1 Robinson, sec. 172, Blk. 2, H.&T.C. Sur., 2½ mi. NE of Raton. T.D. 3,505 ft.; est. 1,000 to 3,800 bbls. day; gravity 40.7 deg.

Gaines County

Amerada Pet. Corp. No. 1 A. Faskin, 660 ft. N and W of SE¼ sec. 160, Blk. G, W.T.R.R. Sur. Drlg 100 ft.
A. G. Carter No. 1 A. L. Wasson et al, sec. 48, Blk. AX, P.S.L. Sur. Drlg. 4,358 ft.
A. G. Carter et al No. 1 Moore-Langdon, sec. 44, Blk. AX, P.S.L. sur. Drlg. 760 ft.
Continental O. Co. No. 1 Jones, sec. 22, Blk. A-7, P.S.L. Sur. R.U.R.
Continental O. Co. 1 Norton, 440 ft. S&W, sec. 46, Blk. AX, P.S.L. Sur. Loc.
T. N. Sloan et al No. 1 Barber, NE cor. sec. 19, Blk. A-28, P.S.L. Sur. Drlg. 1,636 ft.
Wentz Oil Co. No. 1 Dalmont, sec. 5, Blk. A-22, P.S.L. Sur. W.O.C. 4,501 ft.

Garza County

S. Caprito No. 1 Post Estate, sec. 230, Blk. 5, K. Aycock Sur. Drlg. 3,312 ft.

Hockley County

R. F. Duggan et al No. 1 Yellow House Land Co., cen. Labour 11, League 718, State Capitol Lds. Loc.

Howard County

Iron Mt. Oil Co. No. 1 D. H. Snyder, 330 ft. S and E, sec. 28, Blk. 30, Twp. 1s, T.&P. Sur. Cellar.
Moore Bros. No. 1 T.&P. Land Trust, sec. 33, Blk. 20, Twp. 1s, T.&P. Sur. Drlg. 2,903 ft.
Shasta Oil Co. No. 1 Cora Echols, sec. 5, Blk. 15, T.&P. Sur. T.D. 2,785 ft. Acidized. Swabbing.

Hudspeth County

Haymon Krupp Oil & Ld. Co. No. 1 Thaxton, SE¼ sec. 34, Blk. 74, Twp. 6. T.D. 3,040 ft.

Loving County

Barnett Pet. Co. No. 1 Johnson, sec. 2, Blk. 57, Twp. 1, T.&P. Sur. R.U.R.
Barnett Pet. Corp. No. 2 W. D. Johnson, sec. 12, Blk. 56, Twp. 1, T.&P. Sur. Machine.
Finley et al No. 1 W. D. Johnson, sec. 24, Blk. 56, Twp. 1, T.&P. Sur. Drlg. 2,323 ft.
Stanolind O. & G. Co. No. 1 M. Kyle, sec. 20, Blk. 55, Twp. 1, T.&P. Sur. T.D. 3,907 ft.; top sd. 3,870 ft.; oil and wtr.
Woodley Pet. Co. No. 1 Kloh, sec. 21, Blk. 55, Twp. 1, T.&P. Sur. M.I.M.

Mitchell County

Grisham-Hunter Corp. No. 1 Morrison, sec. 34-29-1n, T.&P. Sur. Loc.
Mitchell O. & G. Co. No. 1 Z. Morrison, sec. 36. Blk. 29, Twp. 1n, T.&P. Sur. Drlg. 1,500 ft.

Pecos County

Cannon & Cannon No. 1 University, sec. 2, Blk. 20, Drlg. 606 ft.
Dobbs No. 1 University, sec. 30, Blk. 18. T.D. 725 ft.
Humble O. & R. Co. No. 1 E. M. Gray, sec. 94. Blk 11. G.H.&S.A. Sur.; 5,000-ft. test. Drlg. 4,257 ft.
K. Kimberlin No. 1 Humble-Young, sec. 49, Blk. 10, H.&G.N. Sur. Drlg. 666 ft.
W. Y. Penn No. 1 Tipton, sec. 85, Blk. 8, H.&G.N. Sur. W.O.C. 100 ft.
G. J. Smith No. 1 W. E. Smith, 1483 ft. N and 1.348 ft. E, Sec. 37, Blk. 1, I.&G.N. Sur. R.U.S.T.
S Thompson No. 1 Elsinore Cattle Co., sec. 54, Blk. D, G.C.&S.F. Sur. T.D. 4,910 ft.
Trans-Pecos Oil Co. No. 1 Gallagher, sec. 9-51-10, T.&P. Sur. S.D. 1.475 ft.
Trans-Pecos O. Co. No. 1 Popham. T.D. 535 ft. Set Csng.
Young No. 1 Perry, sec. 3, Blk. Z, T.C. R.R. Sur. S.D. 955 ft.

Presidio County

L. C. Brite No. 4 fee, C NW¼ sec. 113, Blk. 12, G.H.&S.A. Sur. No report.
A. H. Main No. 1 Greenlee, sec. 40. Blk. 347, 13 mi. NE of Marfa. No report.

Reagan County

K. E. Sherman No. 1 W. E. Friend, SW cor. sec. 3, Wm. Allen Sur. S.D. 645 ft.
Moore Bros. No. 1 University, 1,980 ft. N and E, sec. 8, Blk. 7. Loc.

Reeves County

Hill et al No. 1 Ely, W.O.C., 310 ft.; 9 miles S of Toyah.
General Crude Oil Co. No. 1 T. P. Land Trust, C NE¼ sec. 15, Blk. 56, Twp. 2, T. & P. Loc.

Runnels County

K Z Oil Co. No. 1 B. Fletcher, E. C. Good Sur. R.U.R.
Price & Kramer No. 1 Giesecke, Blk. 227, Hughes Sur. Drlg. 1,977 ft.
Stevens & Glover No. 1 Fowler, sec. 150, E.T.R.R. Sur., 2 mi. NE of Ballinger. Drlg. 452 ft.

Schleicher County

J. M. Cooper No. 2 B. Page, sec. 40, Blk. L, G.H.&S.A. Sur. Drlg. 1,101 ft.
Tex.Tor Oil Corp. No. 1 Judkins & Spencer, C of SW¼ sec. 33, Blk. A, A.&B. Sur. M.I.S.T.

Scurry County

Bristow & Cantrell No. 1 Tomlinson, sec 122, Blk. 97, H.&T.C. Sur. Drlg. 2,772 ft.
E. L. Goos No. 1 Henderson, sec. 148, Blk. 97, H.&T.C. Sur. Drlg. 2,437 ft.
C. W. Guthrie et al No. 1 F. W. Hardee, sec. 99, Blk. 97, H.&T.C. Sur.

Terry County

Crump & Corrigan No. 1 Lewright, 660 ft. NE. sec. 1, Blk. C-37, P.S.L. Sur. T.D. 5,133 ft.
R. L. Foree No. 1 A. E. Pool, sec. 54, Blk. D-11, D.&S.E. Sur. Loc.

Upton County

John Ench No. 1 Lyon, 330 ft. S and E, sec. 8, Blk. 3½. M. I. M.

Ward County

F. H. Murphy et al No. 1 Monroe, 1,320 ft. NW and NE, sec. 210, Blk. 34, H.& T.C. Sur. R.U.
Magnolia Pet. Co. No. 1-55 Sealey, sec. 55, Blk. F, G.M.M.B.&A. Sur. T.D. 3,010 ft.; P.B. to 2,985 ft. Bailing water.
L. F. White et al No. 1 Rector-Monroe, E cor. sec. 3, Blk. 1, W.&N.W. Sur. Top Del. L. 4,635 ft.; top Del. sd. 4,670 ft.; S.O. 4,690 ft.; T.D. 4,700 ft.; P.B. 4,698 ft.; shot; flowing.

Yoakum County

Bahan et al No. 1 Shook Est., sec. 420, Blk. D, John H. Gibson Sur. Drlg. 3,900 ft.
Magnolia Pet. Co. No. 1 Mrs. M. E. Taylor, sec. 201, Blk. D, John H. Gibson Sur. Elev. 3,607 ft.; top Yates 3,040 ft.; T.D. 4,024 ft.; R.U.S.T.
Moore Bros. No. 1 Cleveland, sec. 706, Blk. D, J. H. Gibson Sur. Loc.

RANGER (CENTRAL TEXAS) DISTRICT

Brown County

Donald P. Kenyon No. 1 Stone, 2 mi. NW Brownwood; 1,150 ft. fr. SWL and 500 ft. fr. NWL of H. S. Thayer. Sur. No. 206. Rig. up Ellenberger test.
West Texas O. & R. Co. No. 1 J. P. Newton, 3 mi. S Cross Cut; 2,200 ft. from E and 300 ft. from S of W. L. Swain Sur. No. 145. Loc.

Callahan County

Charlie Hobbs et al No. 1 Mike Hughes, sec. 47, D.&D.A. Sur. Drlg. 450 ft.
J. C. Jackson et al No. 1 Thompson, 2 mi. S. Eula, 150 ft. S and W lines of sec. 30 B.B.B.&C. Loc. for 2,000 ft. test.
Mesa Verde Oil Co. No. 1 Klepper, 4 mi. N of Clyde, sec. 69, B.B.B.&C. Sur. Drlg. 1,600 ft.
R. F. St. John No. 1 M. M. Perkins, 3 mi. N. Clyde, 165 ft. from N and 550 ft. from W of farm in sec. 73 B.B.B.&C. Drlg. 360 ft.
B. A. Wilkinson, Trustee, No. 1 F. L. Martin, NW cor. Co.: 250 ft. from N and E lines sec. 69 T.&P. Blk. 14. Loc. for 2,500 ft. test.

Coleman County

Dixie O.&G. Co. No. 1 Reaves, 6 mi. NW Bangs, 775 ft. from S and 2,228 ft. from W of J. M. Rhine Sur. No. 629. Loc.

Comanche County

N. D. Gallagher et al No. 1 Mrs. B. I. Terry, Desdemona pool, N. H. Kuykendall Sur. Spud. and S.D. for 20 in.

Eastland County

J. T. Anderson No. 1 Crist, 8 mi. N of Rising Star, sec. 36, Lavaca Co. Sch. Lds. S.D. 2,155 ft.
Barrett & Moon No. 1 Foote, 4 mi. NE Carbon, 150 ft. fr. W and 250 ft. fr. N of S 40 ac. of W½ NE¼ sec. 9 H.&T.C. Sur., Blk. 2. Spdg.
J. A. Bearman et al No. 1 Mrs. R. L. Poe, S edge Cisco, sec. 79, H.&T.C. Sur., Blk. 4. Drlg. 3,340 ft.
F. J. Estes No. 1 Gentry, A. Popejoy Sur. S.D. 3,000 ft.

Erath County

Jess Hickey et al No. 1 W. M. Martin, 2 mi. SE Desdemona; 530 ft. from N and 165 ft. from W of Subd. 5, D. J. Otho Millard Sur. A-533. M.I.M. for 3,200 ft. test.

Haskell County

Danciger O. & R., Inc., No. 1 Pardue, 8 mi. E Stamford, sec. 48, Thos. Toby Sur., Abst. 396. Drlg. 1,375 ft.

California Fields

(Continued from Page 175)

Oil Co., and consequently this field should remain well up toward the top of the list from a development standpoint.

Kern County

Two new wells were finished in the Fruitvale field of Kern County during the week but neither registered substantial production. Harry H. Magee No. 1 Tasquini was completed pumping 198 bbls. of 15.9 gravity oil cutting 3 per cent per day following completion at 3,154 feet. This well was finished with 71 feet of 7-inch liner including 43 feet of 250 mesh. Meridian Oil Co. No. 3 Turner, bottomed at 3,110 feet and finished with a 7-inch liner carrying 50 feet of perforated, was brought in pumping 220 bbls. of clean 17.9-gravity oil per day. Out in the west front of the Kern River field, Republic Petroleum Co. completed No. 15 Strassburger in section 24-38-27 at 2,035 feet. Finished with 310 feet of 8⅝-inch liner carrying 269 feet of 160 mesh, the well was brought in pumping 255 bbls. of 15.7 gravity oil per day. In the old McKittrick field, where only limited drilling has been undertaken for several years, Weiport Oil Co. completed No. 18 in section 26-29-21 pumping 98 bbls. of 13.1 gravity oil, cutting 17 per cent, from 1,178 feet after the hole had been plugged back from 1,225 feet.

Central West Fields

(Continued from Page 176)

of oil in the Berea sand at 1,648-60 feet and may be drilled deeper.

In Tuscarawas County, section 3, Sandy Township, Status Development Co. has a rig built for the second test on the John Ceckler property.

George Jewell & Co. made a location on the Joseph Harper farm, in section 7, Monroe Township, Guernsey County. In section 15, Millwood Township, M. J. Purdy is rigged up for No. 3 on the Joel Carter lease.

Meigs County

Ohio Fuel Gas Co. completed a small gas well on the William Curs farm, in section 26, Lebanon Township, Meigs County. It was completed below the first Berea sand at 2,132-34 feet. In section 31, same township, Roy Holmes & Co. No. 3 Schyler Bush was drilled through the Berea sand at 1,961-70 feet and gauged 598,000 feet of gas after a shot of 30 quarts. In section 26, Proffitt & Co. is rigged up for a test on the Ked Leslie property. Fleming & Co. abandoned the test on the Nicholas Pierce lease in section 3, Rutland Township. It was drilled through the Maxton sand at 806-15 feet, where it made 40,000 feet of gas naturally. It was abandoned when the hole filled with water. In the same section Nelson & Co. have completed the second test on the Lemoine Hysell property as a commercial gas well. This test was completed below the Salt sand at 708-20 feet and gauged 700,000 feet of gas naturally.

In the same county, section 3, Rutland Township, Ohio Fuel Gas Co. will drill on the Ernest Harrison farm.

In Muskingum County, section 3, Licking Township, Scott & Co. are rigged up at No. 4 William Myers, and in the same section H. H. Everett & Co. are building a rig for No. 3 George Varner. In section 17, Brush Creek Township, Hopewell Gas & Fuel Co. is rigged up at No. 3 William Wentz.

In Fairfield County, section 6, Pleasant Township, City Natural Gas Works is rigged up at No. 6 Rebecca Loose.

Kentucky Fields

(Continued from Page 194)

Branch. The station was closed down six months ago.

The largest flow of the week was reported from Petroleum Exploration No. 14 G. W. Gourley in Lee County. This operation is in the Ida May district and has an initial flow of 100 bbls. per day.

Drilling is reported at a standstill in many sections of Eastern Kentucky.

In Lawrence County the Necessity Oil Co. No. 1 Claud Wheeler on Newcum Creek, Martha district, is down 1,382 feet. Keaton, operator for Ashland Oil & Refining Co., completed pressure well No. 2 on the W. H. Skaggs and Joseph Wheeler land on Keaton Fork of Blaine at a depth of 1,003 feet. No report of flow given.

The Kentucky Oil Producers completed No. 6 Mort Mullins in the same district at 821 feet with a flow of 3 bbls. No further drilling on this farm planned at present.

Jim Hollon, drilling No. 2 George Lovelace on Trace Fork of Stillwater in Wolfe County, is down 2,000 feet with work continuing.

In Estill County, Wiseman Brothers have No. 3 Albert Stewart on South Fork at a depth of 500 feet. A. H. Rickenbrode has put in two strings of tubing in an old well on the L. W. Bratton farm. The well, known as Beam well, is making 20 bbls. of oil per day and is being connected with tank.

In the Wagersville district, Johnie Sparks, drilling No. 24 Houston Tipton, reports a completion at 287 feet with a flow of 5 bbls. Petroleum Exploration No. 29 Thomas Henderson, also on Tickey Fork, was completed at 520 feet with a flow of 3 bbls. C. B. Udlum reports No. 17 Wilson Heirs, in the Wagersville district, completed at 700 feet with a flow of 15 bbls. Claude Townsend No. 2 Dan Miller nearby was completed at 537 feet with a flow of 4 bbls. Petroleum Exploration No. 28 Thomas Henderson, on Tickey Fork, was completed at 450 feet with a flow of 4 bbls., and the same company completed No. 13 Sam Bringar at 325 feet with a flow of 4 bbls. Johnie Sparks No. 12 Clay Alexander was completed at 200 feet with a flow of 2 bbls. John M. Collins No. 1 Moberly, on Millers Creek, was completed at 225 feet with a flow of 5 bbls.

In Lee County, Petroleum Exploration No. 14 G. W. Gourley, in the Ida May district, was completed with an initial production of 100 bbls. It is reported that Operator Hupp is moving in on Brandunburg farm of the same district.

H. D. Parrish, Jr., and others No. 1 Pryse & Gively, on the Brown tract, is down 700 feet. P. Fraley and associates are moving in on No. 3 A. Combs on Billies Fork. Rush Cable is facing a fishing job in No. 5 L. Noe on Little Sinking.

Henry Day, drilling No. 7 Poplar Thicket on the Top Bald Rock hill, is down 700 feet. Evans Oil Co. is moving to No. 10 J. F. Raines on Billies Fork. McGinn & Garrison are moving to No. 1 A. Combs on Billies Fork, and it will be first of next week before getting on location.

In the Wheelersburg district of Magoffin County, C. J. Sipple & Co. have completed No. 20 James Love on Mining Fork at a depth of 950 feet. The flow is reported at 5 bbls. The Morbald Development Co. No. 2 Charles Wheeler on Litteral Fork is down 100 feet.

In Knott County, Inland Gas Corp. No. 1 E. A. Hammonds is down 986 feet working in gritty lime. This operation is on the Right Fork of Troublesome near Hindman. Inland No. 5 S. B. Webb on Jones Fork, near Lackey, is drilling in Maxon sand at 1,320 feet.

Michigan Fields

(Continued from Page 200)

Clarence E. Bliss struck salt water in the Dundee in No. 1 A. N. Palmeter, NE NW NE section 18-9n-1w, an Elba Township deep test in the vicinity of a small Berea gas field. Dundee was topped at about 2,974 feet and the hole drilled to 3,007 feet after striking water at 3,002 feet.

Near the oldest field in Michigan in Dundee Township, Monroe County, the Michigan Pacific Oil & Gas Co. drilled through the Trenton lime without success in No. 1 A. Wohlgamuth, SE NE NW section 7-7s-6e, a Summerfield Township wildcat 3 miles south of the two producing Trenton wells in Dundee Township.

Richard Hall completed one of the few active tests in the Crystal field, Montcalm County, when No. 1 Flint, SE SW NE section 35-11n-5w, Ferris Township, was condemned in the Dundee topped at 3,237 feet and drilled about 30 feet deeper. Two other tests were drilling in Crystal Township, one near completion.

T. F. Caldwell, Inc. plugged and abandoned a tenth dry hole in Taymouth Township, Saginaw County, the No. 1 Birch Run State Bank, NE NW SE section 10-1n-5e, at a total depth of 1,760 feet. Berea was topped at 1,703 feet and the drill went into water from 1,720 to 1,728 feet without a show.

Merchants Oil & Gas Co. had 1,500 feet of oil in the hole in No. 1 Iosco Land Co. test, E half W half NW section 16-14n-2w, Greendale Township, the only Midland County well showing production last week. Dundee was topped at 3,520 feet and oil at 3,580 feet.

Of 14 permits to drill issued by the oil and gas division of the state conservation department last week, six were for wildcat tests and most of the rest for offsets in proved fields.

In addition to the Home Township, Newaygo County wildcat already mentioned with west Michigan developments, King Drilling Co. took out a permit for a test in section 12, Sheridan Township, Mecosta County; T. F. Caldwell, Inc., one for an extension test in section 27, Buckeye Township, Gladwin County; C. W. Spaulding, Trustee, one in section 35, Arabela Township, Tuscola County; Harold J. Hand, one for section 30, Foster Township, Ogemaw County, and the Sun Oil Co., one to be drilled in section 23, Beaverton Township, Gladwin County.

Offset permits were issued for Buckeye-Gladwin, Sherman-Isabella, Salem-Allegan and Richland-Ogemaw.

Oil Man's Calendar

May

29—Robinson, Ill., fifth annual conference of the Illinois-Indiana Petroleum Association.

June

1-3—Colorado Springs, Colo., American Petroleum Institute, mid-year meeting, Broadmoor Hotel.

7—Kansas City, Mo., Oil Field, Gas Well-Refinery Workers of America.

10-12—Pennsylvania Grade Crude Oil Association, annual meeting, on Great Lakes S.S. "Seeandbee," sailing from Buffalo, N. Y.

14-19—Paris, France, Second World Petroleum Congress, during International Exposition.

17—Tulsa, annual meeting, National Stripper Well Association, Mayo Hotel.

20-26—Findlay, Ohio, Findlay's Golden Celebration of Oil and Gas.

25-26—Dallas, Tex., National Oil Scouts Association, annual meeting, Baker Hotel.

June—July

28-July 2—New York, American Society for Testing Materials, fortieth annual meeting, Waldorf-Astoria Hotel, together with fourth A.S.T.M. exhibit of testing apparatus and related equipment.

July

12-13—Santa Fe, N. M., Interstate Oil Compact Commission meeting.

September

(?)—San Francisco, Calif., North American Gasoline Tax Conference.

15-17—Atlantic City, National Petroleum Association, annual meeting, Hotel Traymore.

27—Cleveland, Ohio, American Gas Association, nineteenth annual convention.

September—October

27-Oct. 1—Rochester, National Association of Petroleum Retailers, fifth national convention.

30-Oct. 1.—Tulsa, S.A.E. Fuels and Lubricants Regional Meeting.

October

7-9—Los Angeles, Calif., S.A.E. National Aircraft Production Meeting, Ambassador Hotel.

11-15—Kansas City, Mo.—Twenty-sixth National Safety Congress and Exposition.

11-16—Houston, Tex., Oil-World Exposition.

14-16—Pittsburgh, Pa., mid-year meeting, American Association of Petroleum Geologists, William Penn Hotel.

14-16—Houston, Tex., Independent Petroleum Association of America, annual meeting.

26—New York, Oil Trades Association of New York.

28—New York, S.A.E. Annual Dinner, Commodore Hotel.

29-30—Dallas, Tex., Mid-Continent Oil and Gas Association of Texas, annual meeting.

October—November

27-Nov. 3—New York, National Automobile Show, Grand Central Palace.

November

9-12—Chicago, American Petroleum Institute, eighteenth annual meeting, Stevens Hotel.

December

6-11—New York, Exposition of Chemical Industries, Grand Central Palace.

8-10—Flint, Mich., S.A.E. National Production Meeting.

1938

March

16-18—New Orleans, twenty-third annual meeting, American Association of Petroleum Geologists.

April

17-21—Dallas, Tex., American Chemical Society.

MARKET RECORD, ACTIVE OIL STOCKS

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1937 High	1937 Low	Week ended May 22 Sales	Week ended May 22 High	Week ended May 22 Low	Week ended May 22 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1936	1936 High	1936 Low	1935 High	1935 Low
114⅞	90	1,600	98½	90	98½	Amerada Corp.	788,675	N.P.	50cQ	1-30-37	$2.00	125½	75	80	48½
37	28	6,000	29¾	28½	29¾	Atlantic Refining	2,664,000	$25	25cQ	6-15-37	1.25	35⅛	26⅝	28	20⅛
43⅜	29⅝	4,900	32⅛	29⅝	31¾	Barber Co.	387,149	$10	25c.	6-1-37	.50	38½	21	22½	11¾
35¼	24¼	11,100	27½	24¾	27½	Barnsdall Oil Co.	2,247,974	$5	25cQ	5-1-37	.80	28¼	14⅛	14¾	5⅞
20⅞	11⅛	40,300	12½	11⅛	12½	Columbia Gas & Elec.	11,610,036	N.P.	20c	11-16-36	.40	23⅜	14	15⅜	3⅜
17⅞	14½	31,400	16	14⅝	15¾	Consolidated Oil Corp.	13,919,417	N.P.	20cQ	5-15-37	.80	17¼	11½	12¼	6½
47⅜	39¾	11,400	43½	40⅛	43½	Continental Oil of Delaware	4,682,615	$5	50cQ†	6-30-37	1.50	44⅞	28⅛	35	15⅛
17⅝	12½	41,500	16⅛	14⅛	16	Houston Oil (new)	1,098,618	$25	....	10-17-30	....	13⅞	6⅜	7	1½
35⅜	27½	4,200	29¼	27½	29⅛	Mid-Continent Petroleum	1,855,912	$10	50cSA	6-15-37	1.15	30⅞	17¼	20½	9½
34	25¼	1,700	27½	25¼	27¼	Mission Corporation	1,399,345	N.P.	....	.....	.45	29⅞	16¾	17¾	10⅝
109⅞	62	3,200	106	101	102	National Supply of Delaware	382,591	$25	....	5-15-31	....	75½	19⅞	20⅞	9
22⅞	17⅛	14,800	20¼	18½	20⅛	Ohio Oil Co.	6,563,377	N.P.	50cSA	6-15-37	.60	18	12⅛	14¼	9¼
29¾	20¾	1,100	24	22¾	23¼	Pacific Western Oil	1,000,000	N.P.	65c	12-18-36	.65	23½	11¾	14	6¾
4½	2¾	3,100	3⅛	3	3	Panhandle P. & R.	198,770	N.P.	....	.....	....	4¼	1⅜	1⅞	⅛
59¼	49½	12,800	56⅛	52¾	56⅛	Phillips Petroleum	4,449,052	N.P.	75cQ†	6-1-37	2.50	52⅜	38⅛	40	13¾
29⅞	24¼	5,200	27½	25½	27½	Plymouth Oil Co.	1,050,000	$5	35cQ†	3-31-37	.90	27¾	11⅞	13	6½
24⅜	17¼	35,800	18¾	17¼	18¾	Pure Oil Co.	3,281,120	N.P.	....	9-1-30	....	24⅞	16	17	5⅞
54⅛	36⅝	2,500	42⅞	37½	42⅞	Seaboard Oil of Delaware	1,244,283	N.P.	25cQ	6-15-37	1.00	44	30½	36⅞	20⅜
34¾	25⅝	9,700	29⅜	27¾	29¼	Shell Union Oil	13,070,625	N.P.	25c	12-15-36	.25	28¼	14¾	16½	5⅓
105⅜	102	1,000	103¼	102½	103¼	Shell Union Oil 5½% pfd.	343,500	$100	26⅛c	12-15-36	28.87½	127½	102	111	63⅛
4¼	3½	700	3⅝	3⅝	3⅝	Simms Petroleum	461,698	$10	50c liq.	1-9-37	2.25 liq.	6¾	3½	18⅜	4¾
60⅝	42	2,700	58	52	58	Skelly Oil	1,006,348	$15	50c	7-1-37	....	47⅜	19½	20½	6½
20¼	16¼	36,300	19⅛	17¾	19⅛	Socony-Vacuum	31,151,071	$15	25cSA	3-15-37	.70	17½	12½	15¾	10⅝
50	40⅝	10,400	44	40⅝	44	Standard Oil of California	13,014,754	N.P.	45cQ†	6-15-37	1.20	47⅝	35	41⅛	27¾
50	42	11,100	44½	42	44½	Standard Oil (Indiana)	15,196,241	$25	40cQ†	6-15-37	2.40	48½	32¾	33⅜	23
32	30⅝	200	31	31	31	Standard Oil of Kansas	134,841	$10	$1	12-26-36	1.00	31	25	32	20
76	63⅛	23,900	67⅛	63⅛	67⅛	Standard Oil of New Jersey	25,856,081	$25	$1.25SA†	6-15-37	2.00	70⅜	51⅛	52⅜	35¾
77½	67	1,600	67⅛	66⅝	67⅞	Sun Oil	2,156,825	N.P.	25cQ	6-15-37	$1 & 6% Sk.	91	70	77	60½
65⅛	50⅜	41,500	60¼	56⅝	60	Texas Corp.	10,896,858	$25	50cQ	4-1-37	1.50	55¼	28⅞	30¼	16½
9⅝	6¾	12,200	7½	6⅞	7½	Texas Gulf Producing Co.	888,123	N.P.	5c	12-15-36	.05	8⅞	4⅜	4⅜	2½
16⅝	11¾	19,000	14¼	12⅛	14¼	Texas Pacific Coal & Oil	888,237	$10	10c	6-1-37	.25	15¼	7½	9¼	3¼
21⅝	16⅝	8,700	18⅛	16⅝	18	Tide Water Associated	6,288,512	N.P.	20cQ	6-1-37	.70	21¾	14¾	15⅞	7⅝
28¼	23⅜	7,700	24⅝	23¾	24½	Union Oil of California	4,386,070	$25	30cQ	5-10-37	1.00	28½	20¾	24	14⅝
31½	26½	800	27¾	27	27¼	Union Tank Car Co.	1,200,000	N.P.	40cQ	6-1-37	1.20	31⅝	22⅝	26½	20⅞
6¼	4¼	10,800	5⅞	4½	5⅞	Wilcox Oil & Gas	424,839	$5	....	5-10-28	....	5¼	2¾	3⅛	1

*Ex-dividend. †Includes extras.

New York Curb Exchange

1937 High	1937 Low	Week ended May 22 Sales	Week ended May 22 High	Week ended May 22 Low	Week ended May 22 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1936	1936 High	1936 Low	1935 High	1935 Low
21⅜	16	800	18½	18	18½	Bridgeport Machine Co.	260,000	N.P.	$1	12-21-36	$1.00	21	13¼	14⅛	3⅝
51½	46	150	49	48½	49	Buckeye Pipe Line Co.	200,000	$50	$1Q	6-15-37	3.25	50	39¾	42[illegible]	[illegible]
2¾	1¾	5,400	1⅞	1¾	1¾	Carib Syndicate	799,020	25c	....	.....	....	4⅞	1⅞	[illegible]	1⅝
123	110¼	50	118¼	118¼	118¼	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	6-28-37	7.00	124¾	105	157	115
5⅜	3	50,200	3¼	3	3¼	Cities Service	37,804,394	N.P.	....	6-1-32	....	7⅜	3	3¼	¾
4⅝	1¼	8,700	1¾	1¼	1⅝	Cosden Oil	399,687	$1	....	.....	....	4½	1½	1½	¼
38	28½	10,200	35	32½	34¾	Creole Petroleum	6,974,356	$5	50cSA†	6-10-37	.50	39	19⅞	23¾	10
18⅝	12	1,800	13⅛	12	13⅛	Darby Petroleum	351,390	$5	25cSA	7-15-37	.50	18⅛	9	8⅞	4
8¼	5¼	2,500	7¼	6½	6½	Derby Oil & Refining	263,162	N.P.	....	.....	....	6¾	1⅞	2	⅝
47½	36½	No sales	..	..	..	Eureka Pipe Line	50,000	$50	$1Q	5-1-37	4.00	47½	38½	38	33¼
63½	51⅝	4,300	56	52	56	Gulf Oil Corp.	9,076,202	$25	25cQ	4-1-37	1.50, 100% Stk.	59	36	74¾	50¼
87	75	2,200	78½	75½	78½	Humble Oil & Refining	8,923,935	N.P.	37½cQ	7-1-37	1.50	80	57	64	44
24¼	20⅛	4,700	21⅝	21¼	21½	Imperial Oil of Canada	26,919,871	N.P.	62½cSA†‡	6-1-37	1.25	24½	19¾	22½	15⅜
15	7¾	600	11⅝	11½	11⅝	Indiana Pipe Line	300,000	$10	30cSA	5-15-37	.80	9¾	5½	6⅛	3⅝
39½	33¾	6,100	36½	35⅞	36½	International Petroleum	14,247,088	N.P.	$1.25†‡	6-1-37	2.50	39⅝	32⅝	39¾	28
15¼	11⅜	2,700	12½	11⅝	12½	Louisiana Land & Exp.	3,000,000	N.P.	10cQ	3-15-37	.50	15⅜	9⅞	11⅜	4⅜
26¾	16⅛	8,700	23⅞	20¾	23⅞	Lion Oil Refining	270,000	N.P.	25cQ	12-26-36	.75	17¾	7⅝	8⅛	3½
14¼	10⅜	4,100	11¼	10⅞	10⅞	Lone Star Gas	5,382,723	N.P.	20c	4-20-37	.60	14¼	9⅞	10⅞	4½
14⅝	10	900	10⅜	10	10	Midwest Oil Co.	998,444	$10	50c	6-15-37	....	..	..	..	..
7⅞	6	1,300	6¼	6	6	Mountain Producers	1,682,182	$10	30cSA	6-15-37	.60	8⅜	5	5¾	4⅛
19½	15¼	2,600	15⅞	15¼	15⅞	National Fuel Gas	3,810,183	N.P.	25cQ	1-15-37	1.00	23	17⅜	20	11⅜
12½	10	900	12¼	11½	12	National Transit	509,000	$12.50	45cSA	6-15-37	.75	15¾	9¼	10⅝	6¾
6⅛	4¾	No sales	..	..	..	New Bradford Oil	1,445,202	$5	15cSA	4-15-37	.10	4⅝	2⅞	3¼	2
5	2⅝	500	2¾	2⅝	2⅝	New Mexico and Arizona	1,000,000	$1	1c	12-1-36	.01	6⅝	1⅝	2½	1
5⅜	4½	No sales	..	..	..	New York Transit	100,000	$5	15cSA	10-15-36	.35	6¼	4¼	4⅞	3
12¾	7½	400	11	10¾	10¾	Northern Pipe Line	120,000	$10	40c	6-1-37	.40	9¾	4⅞	8	5¼
9⅝	5½	153,000	9⅛	7⅛	8⅞	Pantepec Oil	1,608,700	N.P.	....	.....	....	10⅛	3¼	4⅜	1¼
13¾	5⅜	4,200	6½	5¾	6¼	Root Petroleum Co.	336,045	$1	25c	11-2-36	.50	19¼	4½	5	1½
6½	4	1,600	6⅛	5½	5¾	Ryan Consolidated	296,931	N.P.	....	.....	....	4¾	1⅞	2½	⅝
48	42	2,500	43	42⅛	43	South Penn Oil	1,000,000	$25	60cQ†	3-29-37	2.60	44	32½	34½	21⅝
7¼	5	100	5¼	5¼	5¼	Southern Pipe Line	100,000	$10	20cSA	3-1-37	.25	7⅞	3¼	5	3⅞
42	30	No sales	..	..	..	South West Penna. Pipe Lines	35,000	$50	50cQ	4-1-37	13.00	60	44	56	44¼
20¾	19	3,100	20⅛	19⅛	20⅛	Standard Oil of Kentucky	2,604,790	$10	40cQ†	6-15-37	1.35	23⅜	17⅛	24	18
13¾	11	500	12	11½	11½	Standard Oil of Nebraska	188,403	$25	25c	3-29-37	.25	14⅝	11	12	7¾
45	33¼	500	36¼	35½	36¼	Standard Oil of Ohio	753,740	$25	25cQ	3-15-37	2.00	40	21¾	23⅝	11½
4⅞	3¾	7,900	4	3¾	4	Sunray Oil	1,910,119	$1	5c	4-26-37	.10	5	2⅝	2⅞	⅞
7⅝	5⅝	300	5½	5½	5½	Texon Oil & Land	336,028	$2	15cQ	3-31-37	.60	9¾	5⅜	6⅞	5

*Ex-dividend. †Includes extras. ‡Payable in Canadian funds.

Note—In comparing highs and lows for the several years in the two tables, it will be necessary to take into consideration cases where there have been stock split-ups.

PERSONAL

HARRY C. WIESS, Houston, Tex., president of Humble Oil & Refining Company, addressing the annual convention of the Texas Bankers Association in San Antonio on "The Banker and the Oil Man," said Texas gives 41.5 per cent of the oil produced in the country and 25 per cent of all produced in the world. "Our refineries are operating at a rate of 925,000 bbls. daily. Approximately 160,000 persons are employed by the industry in Texas. The value of crude produced in 1936 was $470,000,000, exceeding the income from all farms and ranches in the state."

ROBERT E. GALLAGHER, of Alma, Mich., has been elected president of the Arrow Drilling Company; E. W. LEEDER, vice president and treasurer; M. C. OBREST, secretary. WILLIAM REYNOLDS is field superintendent and OTTO MISCH a director.

C. W. KRAUSE, head of the land department, and ED SMITH and CHARLES SOUTHARD, workers in the same department, for the Ohio Oil Company, Tulsa, have gone to the newly opened office of the company in Houston, Tex. Others transferred to Houston are W. D. YOAKAM, assistant to ROSS C. GWILLIAM, and H. A. MILLER, LEWIS WALKER, JACK STROMAT, ROY DICKENS, WALTER CROUSE and DWIGHT DeHAVEN, all in the accounting department.

LLOYD DOWNING, formerly with Manning & Martin, Inc., and the Texas Company, has been made superintendent of the Midwest Drilling Company, a new concern formed with a capital of $250,000 to operate rotary tools in the Rocky Mountain area. Headquarters are in Casper, Wyo.

O. H. WHITE, Michigan oil and gas field umpire under the NRA and former manager of the Porter Brine Disposal Company, has been named umpire for the new Buckeye Township, Gladwin County, field, only pool in Michigan now under proration. He has established an office in Mount Pleasant.

SAM F. PRATT, European manager for the Pennsylvania Grade Crude Oil Association, with headquarters in London, England, is reported to be recovering in a London hospital following an operation undergone May 8. Word was received at the office of the association that his condition was encouraging. Mr. Pratt, who formerly represented the association in Baltimore, Md., is a former resident of Oil City, Pa.

R. R. HOBSON, general manager for the Houston Oil Company, made a tour of inspection through the East Texas field the past week.

L. C. PETERS, district superintendent of Humble Oil & Refining Company, in charge of the Kilgore district, has been made superintendent of the London district in the East Texas field.

S. B. EDWARDS, independent operator of Fort Worth, Tex., has been named city manager by the newly elected council of that city. Mr. Edwards, always a civic leader, was mayor of Thurber when he resided in that West Texas town.

C. L. MOODY, chief geologist of Ohio Oil Company in Shreveport, La., was honor guest at a stag barbecue given May 22 by the Shreveport Geological Society, following his recent election as vice president of the American Association of Petroleum Geologists.

J. P. RUCKMAN, district superintendent for the Hobbs (New Mexico) district for the Humble Oil & Refining Company, has been transferred to McCamey, Tex., as district superintendent in charge of the Hurdle, Big Lake, Yates and Sand Hills districts. He was succeeded by H. S. McGARRY, transferred from the London district.

ELLIS STALLARD, clerk in the scouting department, Carter Oil Company, Tulsa, has been promoted to scout in western Kansas, working out of Great Bend. He succeeds BEN RICHARDS, scout-geologist, who hereafter will be employed entirely as geologist. VIRGIL RICHARDSON was transferred from the Wichita office to Tulsa to succeed Mr. Stallard.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Theodore M. Shearer, veteran Pennsylvania oil producer, dies in Butler, Pa., age 70 years.

Pennsylvania crude has been advanced to $1.13 per barrel.

British railway companies are considering the adoption of the diesel engine for locomotives. They are tired of coal miners' strikes.

Oil companies were heavy losers by reason of a $1,000,000 fire in the Houston, Tex., business district. The Texas Company offices were badly damaged.

20 YEARS AGO

The combined production of the Mid-Continent and Gulf Coast fields is 483,360 bbls. divided as follows: Kansas 75,500 bbls.; Oklahoma 276,750 bbls.; Texas outside the Gulf Coast 36,400 bbls.; North Louisiana 25,455 bbls.; Gulf Coast 69,255 bbls.

Dorsey Hager, Tulsa geologist, and Miss Mary Hathaway Taber will be married in New York on June 6 and will reside in Tulsa.

Ten Kansas oil scouts march to the El Dorado court house and sign up to fight the kaiser.

A. C. Hawkins, 83, prominent oil producer in West Virginia, dies at his home in Bradford, Pa.

10 YEARS AGO

Seminole operators meet in New York and agree to restrict new drilling. The 450 wells now drilling in the area will be completed. The field is producing 360,000 bbls. per day.

Charles A. Lindberg, who recently flew from New York to Paris in a small monoplane used only 325 gallons of gas. He carried 451 gallons.

The average cost of drilling a well in the Yates pool, Pecos County, Texas, is $8,000. The top of the big pay is found from 995 feet to 1,186 feet.

WILLIAM C. FISHER, president of Model Oils, Ltd., of Calgary, Alberta, has returned from a trip to the Montana oil fields.

JOHN W. CARTER, scout for the Tide Water Associated Oil Company in San Antonio, Tex., is in St. Joseph's infirmary, Houston, Tex., recovering from illness.

CHARLES LANGFORD, engineer in the East Texas division of the Texas Railroad Commission, has been transferred to the oil and gas division of the commission in Austin.

J. C. TREES, Pittsburgh, Pa., has been elected president of the Big Lake Oil Company, succeeding the late J. C. FARQUHAR. Mr. Trees recently visited Texas fields where his company holds producing properties.

DONALD J. HANNA, executive of Standard Oil Company of California, accompanied by MRS. HANNA and their son, DONALD, JR., sailed from New York May 22 aboard the Grace Line's Santa Elena, which will touch at several South American and Pacific Coast ports.

W. A. TROUT, formerly vice president of the Emsco Derrick & Equipment Company, and G. A. RASMUSSEN have been elected vice president and secretary-treasurer respectively of the Signal Petroleum Company of California, succeeding R. F. INGOLD and JONAH JONES, JR.

CLAUDE STRAHAN, scout for the Atlantic Refining Company, Shreveport, La., and president of the National Oil Scouts Association, was in Dallas, Tex., last week conferring with HOWARD BOYD, chief scout for the Magnolia Petroleum Company, who is secretary-treasurer of the Scouts organization.

PARAGRAPHS

K. H. FLINT, Amherst 1923, and M. I. T. 1925, formerly chief inspector in the testing laboratories of the American Gas Association, Cleveland, Ohio, has been advanced to assistant chief engineer. W. H. VOGAN, Tri-State College of Engineering 1927, succeeds Mr. Flint. W. M. COUZENS, Tri-State College 1926, recently was placed in charge of all the laboratory's research activities.

ADDISON B. DAY, former president of Southern California Gas Company, was elected chairman of the board following the recent merger of that organization with Los Angeles Gas Company. A. B. McBETH was made president and general manager. Other officers are H. L. MASSER, executive vice president; LeROY M. EDWARDS, vice president and special counsel; T. J. REYNOLDS, vice president and general counsel; R. W. MILLER, R. M. BANKS, F. J. SCHAFER, WILLIAM MOELLER, JR., and W. E. HOUGHTON, vice presidents; C. L. WHITEHILL, secretary; F. E. SEAVER, assistant secretary; E. N. SIMMONS, comptroller; L. D. ROMIG, treasurer.

J. B. SMITH, formerly division manager in Chicago for Skelly Oil Company, is now sales manager of Vickers Petroleum Company. He succeeds MYERS GROSS, who has retired from the oil business and will move to Florida to look after personal interests.

STUART SHERAR, formerly connected with the Humble Oil & Refining Company and Carter Oil Company; W. K. ESGEN, formerly division geologist for Humble, and L. V. MANRY, division land man for the same company, have resigned and formed the Trinity Petroleum Company, with headquarters in Corpus Christi, Tex. W. A. MALEY has been appointed division geologist to succeed Mr. Esgen, and J. E. CARR has been appointed division land man to succeed Mr. Manry.

GEORGE W. STRAKE, independent oil man of Houston, Tex., was the principal speaker before the Foreign Trade Conference in that city last week. His subject was "Oil and the Part It Plays in Foreign Commerce." Mr. Strake discovered the Conroe field. Geologists had made unfavorable reports, but he had a conviction that oil was there. He tried futilely to get financial help in drilling a test well. Eventually he decided to start one himself and "trust to God his money would hold out." One day before his lease would have lapsed "Strake's Folly" came in.

JUDGE JAMES W. FINLEY has resigned as general counsel for the Empire Companies at Bartlesville, Okla., because of ill health.

A. M. STAFFORD, assistant to E. C. CRAWLEY, vice president of the Consolidated Oil Corporation in New York, is making a tour of offices in the Mid-Continent area.

WALTER and IAN REID, sons of the general manager of International Petroleum Co., Lima, Peru, left New York Friday on the Santa Clara to join their father in South America for the summer.

C. M. BALDWIN, of Oologah, Okla., accompanied by MRS. BALDWIN, sailed from New York May 21 on the Santa Clara for Talara, Peru, where Mr. Baldwin is in the service of the International Petroleum Company.

A. JACOBSEN, New York, president of Amerada Petroleum Corporation, is visiting the company's Mid-Continent offices and some of its field properties. He was in Tulsa this week, arriving there from Fort Worth, Tex.

F. T. NORRIS, manager of the Northern Alberta division of Imperial Oil, Ltd., has been transferred to Calgary to take charge of the Southern Alberta division. S. R. STEVENS, previously in charge at Calgary, will take charge of the Northern Alberta division.

J. M. CAMPBELL, formerly vice president of the Alpha Petroleum Company and president of the Malta Oil Company, has been elected president of the Reiter-Foster Oil Corporation of Tulsa. Mr. Campbell succeeds JAMES G. LYONS, who is retiring to devote time to his private interests.

Made Chief Geologist

Harold W. Hoots, recently appointed chief geologist of Richfield Oil Corporation with offices in Los Angeles, graduated from Oklahoma University with a B.S. degree in 1921. He immediately entered the employ of the U. S. Geological Survey, working in Oklahoma, Texas, Wyoming and California. He took a year's graduate work in geology at the University of Kansas and another two years studying the same subject at Stanford University. He completed his graduate work at Stanford with a Ph.D in 1925. He then returned to the U.S.G.S. and worked in California until 1928, when he entered the employ of Union Oil Company as a geologist.

H. W. HOOTS

During his association with the geological survey he wrote several bulletins on the geology of West Texas, Wyoming and parts of California. He was appointed assistant chief geologist of Union Oil Company in January, 1937, and held this position at the time he resigned to accept appointment as chief geologist of Richfield Oil Corporation.

Mr. Hoots is a past president of the Branner Club, composed of California geologists. The club is named for the late Dr. John Casper Branner, who for years headed the department of geology at Leland Stanford University and became president of the university. Mr. Hoots is a former president of the Pacific Section of the American Association of Petroleum Geologists and during the national convention of this organization held in Los Angeles in March, 1937, he was program chairman. He resides in Glendale, Calif.

J. J. JENKINS, drilling contractor of Kilgore, Tex., has been elected president of the Kilgore Chamber of Commerce.

HORACE C. FITZPATRICK, in the producing department of the Sinclair Prairie Oil Company, returned to Tulsa Friday from a tour of company properties in Wyoming.

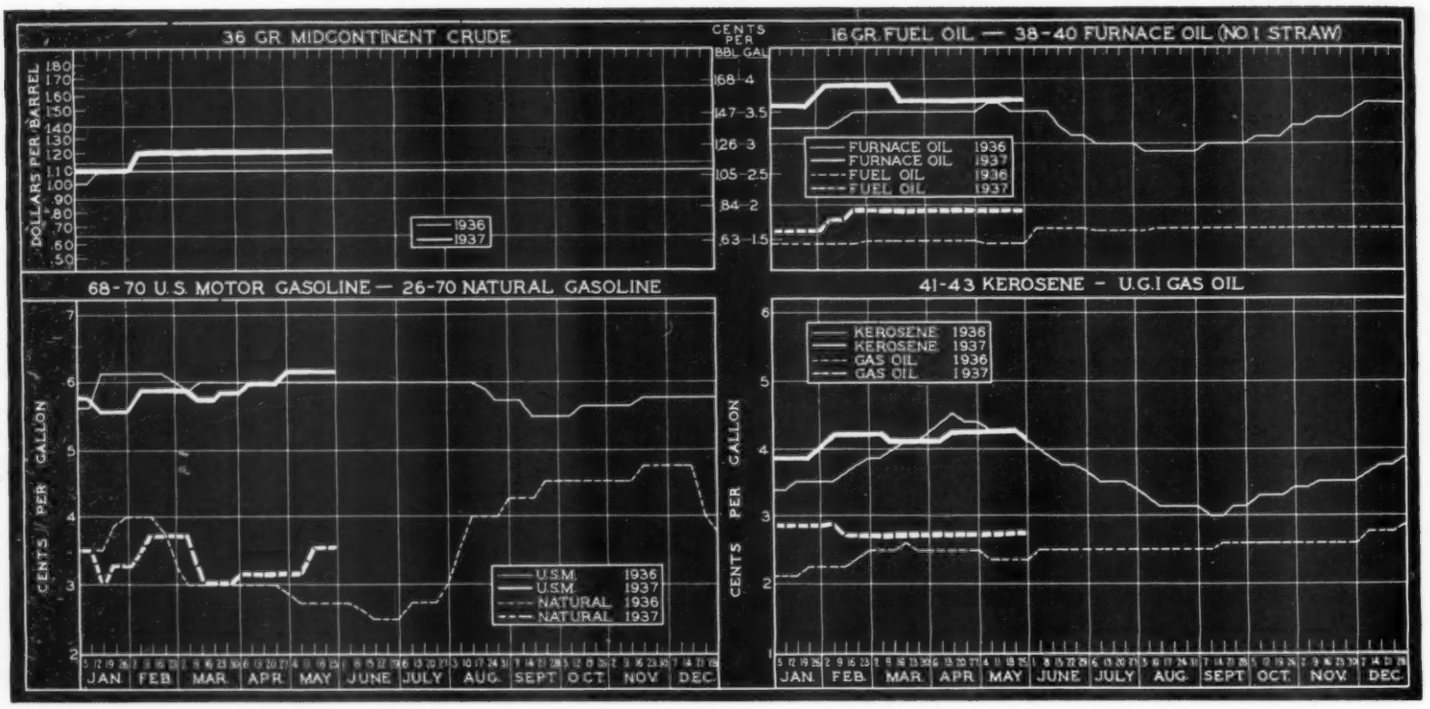
GEORGE McDONALD, of Petrolia, Ontario, flew from Detroit, Mich., to Miami, Fla., and thence to Trinidad, where he will be in the service of the Leaseholds Oil & Gas Company.

P. R. RUTHERFORD, president of the Rutherford Drilling Company, Houston, Tex., and H. M. STALCUP, vice president of the Skelly Oil Company, left for a bear hunt in Wyoming.

CHARLES S. JONES, Los Angeles, Calif., president of Richfield Oil Corporation, went to New York to attend a board meeting and transact other business which was expected to keep him in the East for about two weeks.

MARTIN EDWARD CHAPMAN has resigned as division engineer of the Gulf Oil Corporation in charge of its acidizing, repressuring and reconditioning work from division offices in Chase, Kans., to become the Oklahoma-Kansas representative of Chemical Process Company, Breckenridge, Tex.

RAYMOND H. COE, district engineer for Tide Water Associated Oil Company in Cayuga, Tex., and MISS NANCY DE BRUIN, of Conroe, Tex., were married Friday noon, May 21, in the Conroe Episcopal Church. After a honeymoon trip planned to include Robinson, Ill., and points in Wisconsin, they will reside in Cayuga.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Gasoline Livelier in Group 3 Market But Naturals Still Lead the Field

By T. F. SMILEY

Responding to the bracing influence of improved motoring conditions, declining jobber stocks and renewed gossip about crude price advances, gasoline began to emerge from its lethargy in the Group 3 area this week. Notwithstanding assertions that the 8-cent raise in East Texas did not portend a general advance, it contributed to the feeling that gasoline purchases made now would invite no loss and might easily show a profit soon; for indications pointed to higher quotations at both the refinery and the pump.

Smart Upturn Expected

Refiners and resellers reported orders were coming in at a little better rate this week, and with Memorial Day extending the week-end holiday to virtually three days this year a smart upturn in gallonage was expected. Then will come the close of schools and colleges, which spurs gasoline demand. Contract movement was reported growing in volume.

In explanation of the market's slowness in getting under way this year it was said that several weeks ago, when there was much talk concerning advances in the price of crude, jobbers filled their gasoline tanks to avoid paying the higher figures which increased crude costs were expected to bring. With the jobbers thus prepared against crude advances which did not materialize, wretched driving weather set in throughout most of the territory supplied by Group 3 refiners. When the sun did begin to shine, it did not affect motor fuel sales immediately, for the jobbers already had plenty of material to meet the gradually quickening consumption.

Refined Oil Market Barometer

Improved driving conditions continue to strengthen the motor fuel market, and observers say early estimates of 1937 gallonage are likely to prove low. Natural gasoline is still holding its contra-seasonal gains. Fuel oils in active demand, with prices tending upward, largely as a result of buying for next fall's requirements. Kerosene and tractor fuels steady.

MID-CONTINENT. Gasoline firmer. Naturals lively. Lubricants steady.

EAST COAST. Fuel oil tight, with prices higher. Gasoline gaining strength.

GULF COAST. Gasoline strong. Kerosene and fuel oils in active demand.

CALIFORNIA. Gas oil and diesel fuel strong, prices higher. High sulfur fuel weak.

PENNSYLVANIA. High-octane gasoline very strong. Kerosene demand better.

CHICAGO. Tankcar gasoline steady, but tank-wagon and retail prices somewhat irregular.

Natural gasoline continued to be the prodigy of the Group 3 tankcar market this week. At a season when the graphs prove it should be looking around humbly for buyers it was saucily showing its heels to the rest of the oil products. Some jobbers, forced to go into the spot market for 26-70 to fill immediate needs, paid 3½ cents f.o.b. Panhandle, which takes a freight rate 2½ cents a hundredweight higher than Group 3. In a few cases they had to pay 3¾ cents Group 3.

Buying for fall and winter requirements begins ordinarily in August, but it would not excite wonder if July saw the start this year. So June takes on new interest. That month and May are normally a period of low demand for the naturals; but if the present sprightly market, which already has flouted the May tradition, is maintained through June, the natural gasoline price graph for 1937 will establish a new pattern.

Moving to Gulf Ports

The relatively tight condition of natural gasoline was ascribed chiefly to brisk buying for export or coastwise shipment. Texas natural has not been in competition with the Oklahoma product in northern areas recently. Virtually all the Texas output has been moved to Gulf ports. On account of the price of both natural gasoline and 70-octane naphtha the practice of blending these materials to make motor fuel has been abandoned in great measure by jobbers, who instead are buying cracked gasoline. Casinghead is still being blended with third-grade gasoline, however.

An important factor too in the unusual performance staged by the naturals this year is the fact that large manufacturers are holding stocks intact to make sure of their ability to supply the fall demand, for which they already have made commitments. While there is no question about natural gasoline experiencing really remarkable activity this spring, informed observers say a quarter-cent or so of the prevailing prices does not rest on real market strength.

Current demand was taking care of output in the heating oils, kerosene, tractor fuels, lubricants and wax, with few changes in prices.

Interest in Fuel Oil Market Continues to Dominate North Atlantic Area

By H. STANLEY NORMAN

NEW YORK, May 25.—Interest and activity in fuel oils continued last week to dominate the northern Atlantic seaboard petroleum market. Greater movement of gasoline was noted from terminals to dealers, but the price range is unchanged generally.

A good part of the interest now focused on fuel oils is in anticipation of early disclosure of next winter contracts by the major suppliers. Activity in the market indicates that next winter's fuel oil supplies will be projected on a higher scale. In view of the anticipated upward movement, many jobbers in position to carry stocks through the summer are picking up available bargains.

Willingness of refiners to contract ahead for fuel oil production of the smaller units chiefly interested in gasoline and light products may also be fairly considered evidence of trends in the market. Various indications, in addition to the recent general advance of heavy fuel oils along the entire Atlantic and Gulf coasts, all point to improvement in this particular market.

Preliminary reports available at the end of last week indicated that another healthy slice was taken from gasoline stocks in the hands of refiners and at terminals. The few preliminary indications now available to the trade hold out the possibility that this summer's gasoline business may exceed even the more liberal estimates made at the turn of the year. Although data are insufficient to form a conclusive opinion, the inquiries pouring into touring service offices maintained by oil companies, indicate that all existing travel records will be eclipsed in 1937's summer season.

Another indication encouraging to the oil business is the possibility that manufacturers' estimates of 5,000,000 new cars for 1937 may be exceeded or at least fulfilled. Exclusive of Ford, 863,802 vehicles were produced during the first quarter despite the strikes in Chrysler and General Motors plants which completely halted production during a part of the period.

Most of the depressed spots in the retail gasoline market in the northeastern part of the country have been eliminated or considerably modified during the past two or three weeks. The general tendency to elevate retail prices probably is the result of individual dealers finding that the demand continues unabated whether the market is down at a mere dollar "swapping" basis or on a profitable level. Furthermore, some of the dealers who had their first experience at managing their own business during the latter part of 1936 are just now learning the necessity for sufficient margin to provide a profit.

Most open market tankcar gasoline sales in the New York territory are currently made on the basis of 7.125 to 7.25 cents per gallon for 65 octane motor fuel. The same material is available at 7 cents in barges from one or two suppliers, but none whatever has been reported sold at 6⅞ cents for nearly a month.

The attraction of greater margin on premium motor fuel was extended last week by Atlantic Refining Co. to dealers handling that company's products in Pennsylvania and Maryland. It thus met the action which previously had been taken by Standard Oil Co. of New Jersey. The Atlantic reduced its dealer tank-wagon prices on "Atlantic Ethyl" a half-cent, and at the same time it lowered its tankcar price to jobbers three-quarters of a cent in the two states. Socony-Vacuum Oil Co. is granting the greater margin in New Jersey to meet competition there by Standard of New Jersey, but has not adopted the policy for its New York and New England business so far. There is talk current in trade circles that the practice will eventually spread to all sections of the East and probably to other parts of the country as well. In the past, however, refiners have been reluctant to consider the proposal of extending additional inducement to jobbers and tank-wagon customers, taking the position that premium grade customers will demand the type of fuel they want without encouragement of personal sales effort. With a spread of purchasing power, however, some are now contending that the potential users of premium motor fuel have expanded to a point where additional sales efforts will more than compensate for the half or three-quarters of a cent special inducement to dealers. Following through this line of reasoning, the proponents assert that the additional margin is sufficient to command the best personal sales efforts of service station attendants and jobbers.

Over the past two weeks, heavy fuel oil prices have been adjusted upward at practically all important terminals on the Atlantic and Gulf coasts. Last week brought inclusion of Philadelphia in the general price advance which ranged from 5 cents per barrel at most Gulf Coast ports to 20 cents per barrel at one point in the Caribbean, St. Thomas, V.I. The advance at most Atlantic points was 15 cents per barrel, at New York, Boston, Baltimore and Philadelphia.

Despite the advanced price, fuel oil remained one of the tightest items on the list and some open market offers of $1.40 per barrel, were said to have failed to attract suppliers in New York. On the Gulf Coast, cargo lots of fuel oil are moving moderately at 95 cents per barrel, while offers of .925 cents are said to have failed to attract business. Difficulty in arranging for boats to move fuel oil cargoes north is one of the important factors in keeping the market free of all slack

(Continued on Page 216)

NAVY DEPARTMENT FUEL OIL AND MOTOR FUEL PURCHASES

East Coast Fuel Oil

Contractor—	Bbls.	Total cost	Per bbl.
Belcher Oil Co.	92,000	133,940	$1 455
Shell Pet. Corp.	90,000	103,500	1 15
City Fuel Oil & Coal Co.	11,000	15,310	1 391
Colonial Bunker Oil Co.	36,000	50,400	1 40
Texas Co.	70,000	104,000	1 485
Atlantic Ref. Co.	260,000	393,600	1 511
Maritime Oil Co.	17,300	21,752	1 257
Humble O. & R. Co.	6,025	6,657	1 104
Tide Water	4,500	9,900	2 20
Sinclair	26,100	57,740	2 212
Standard of Kentucky	3,000	7,230	2 41
Newport Oil Co.	3,900	9,924	2 544

West Coast Fuel Oil and Diesel Oil

Texas Co. of Calif.	40,000	40,000	$1 00
Signal Oil Co.	5,000	5,250	1 05
Standard of Calif.	40,250	58,989	1 465
Union Oil Co. of Calif.	4,126,854	3,281,284	.79

West Coast Motor Gasoline

	Gallons	Total Cost	Per gallon
Texas Co.	135,000	14,310	$ .106
Standard of Calif.	5,726,700	677,988	.118
Gilmore Oil Co.	202,000	23,200	.110
Union Oil Co.	1,055,500	115,396	.109
Signal Oil Co.	850,000	86,187	.101
General Pet. Co.	105,000	11,525	.109
Shell Oil Co.	710,000	75,900	.106
Tide Water	276,000	29,685	.107

East Coast Aviation Gasoline

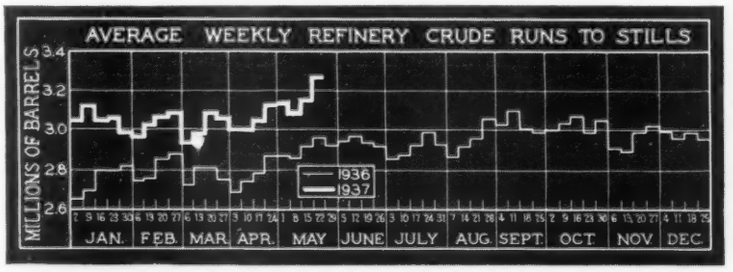
Colonial Beacon	206,000	26,360	$ .127
Humble O. & R. Co.	8,000	1,900	.237
Standard of Pennsylvania	15,000	1,607	.107
Shell Pet. Corp.	41,000	5,760	.140
Shell Union Oil Corp.	300	43	.143

A. P. I. Weekly Refinery Statistics

Week Ending May 22, 1937

	Capacity reporting (per cent)	Daily crude runs (bbls.)	Total gasoline (bbls.)	Gas oil and fuel oil (bbls.)
East Coast	100.0	567,000	18,757,000	6,493,000
Appalachain	88.4	110,000	2,834,000	618,000
Indiana, Illinois, Kentucky	92.1	459,000	13,918,000	4,845,000
Oklahoma, Kansas, Missouri	84.6	298,000	9,014,000	3,058,000
Inland Texas	56.6	124,000	2,025,000	1,448,000
Texas Gulf	95.5	730,000	10,304,000	6,500,000
Louisiana Gulf	96.3	133,000	1,490,000	1,797,000
North Louisiana and Arkansas	63.7	45,000	444,000	341,000
Rocky Mountains	69.7	53,000	2,032,000	737,000
California	90.9	531,000	14,457,000	67,017,000
Total reported	88.8	3,050,000	75,275,000	92,854,000
Estimated unreported	.....	240,000	4,552,000	2,257,000
*Estimated total	.....	3,290,000	79,827,000	95,111,000
*Estimated total previous week	.....	3,135,000	80,378,000	95,316,000
*May 23, 1936	.....	2,975,000	72,490,000	100,212,000

*Bureau of Mines, currently estimated.



Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATES)

Week ending May 8, 1937	304,148,000 barrels
Week ending May 1, 1937	303,249,000 barrels
Week ending May 9, 1936	315,325,000 barrels

RETAIL OIL MARKETS

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of May 25, 1937

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county and city taxes. The gasoline is the regular or standard grade. In most areas a third grade and a premium grade are also available.

Standard Oil Co. (Indiana)

	Gasoline			Kero.
	Tank wag.	Dir.	Inc. tax	tank-wag.
Chicago, Ill.	16.0	14.0	4.0	10.1
Decatur	16.0	14.5	4.0	10.1
Joliet	16.0	14.5	4.0	10.1
Peoria	16.0	14.5	4.0	10.1
Quincy	15.8	14.3	4.0	9.9
Davenport, Ia.	16 0	14.5	4 0	10 1
Des Moines	15 8	14 3	4 0	9 9
Mason City	16.2	14.7	4.0	10.3
Sioux City	16 0	14.5	4.0	10.1
Duluth, Minn.	16.8	15.3	4.0	10.9
Mankato	16 4	14.9	4.0	10.5
Twin Cities	16.4	14.9	4.0	10.5
La Crosse, Wis.	17 4	15 9	5 0	10 5
Green Bay	17.7	16 2	5.0	10.8
Milwaukee	17.3	15 8	5 0	10 4
Detroit, Mich.	15.4	13.9	4.0	9.8
Grand Rapids	16.5	15.0	4.0	10.9
Saginaw	16.3	14.8	4.0	8.5
Evansville, Ind.	17.5	16.0	5.0	†10.6
Indianapolis	17.7	16.2	5.0	†9.6
South Bend	17.9	16.4	5.0	†9.6
Fargo, N. Dak.	17.4	15.9	4.0	11.5
Minot	18.6	17.1	4.0	12.7
Huron, S. Dak.	17.8	16.3	5.0	10.9
Kans. City, Mo.*	15.4	13.9	4.0	8.9
St. Louis*	15.7	14.2	4.0	9.8
St. Joseph*	15.4	11.4	4.0	6.9
Wichita, Kans.	14.9	13.4	4.0	8.9

*State tax 2 cents, 1-cent city tax and 1-cent federal tax. †Does not include 4-cent state tax.

(Exclusive of state general sales taxes, except Indiana and South Dakota.)

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gallons or more, 1.5 cents off; minimum delivery 25 gallons.

Stanolex Fuel Oil in Chicago

Effective Dec. 7, 1936, f.o.b. Chicago tank-wagon prices: Range oil, 1-99 gallons, 8.5 cents; 100-149 gallons, 7.5 cents; 150 gallons and over, 7.3 cents. Stanolex No. 1, 1-99 gallons, 8.3 cents; 100-149 gallons, 7.8 cents; 150 gallons and over, 7.0 cents. Stanolex furnace oil, 1-149 gallons, 7.8 cents; 150 gallons and over, 7.0 cents. Stanolex A, 1-399 gallons, 5.75 cents; 400 gallons and over, 4.75 cents. Stanolex B, 1-799 gallons, 5.75 cents; 800 gallons and over, 4.75 cents.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline			Kero.
	Tank wag. dir.	Tank car con'r.	Inc. tax	tank-wag.
Atl'tic City, N. J.	13 0	11.5	4.0	8.0
Newark	12.5	11.0	4.0	8.0
Annapolis, Md.	15.1	13.6	5.0	10.0
Baltimore	14.5	13.0	5.0	8.5
Cumberland	16.9	14.4	5.0	10.0
Wash'g'n, D. C.*	12.5	11.0	3.0	9.0
Danville, Va.	17.7	15.2	6.0	12.9
Norfolk	16.5	14.0	6.0	11.5
Petersburg	16.8	14.3	6.0	11.7
Richmond	16.8	14.3	6.0	11.7
Roanoke	18.0	15.5	6.0	12.9
Charles'n, W. V.	16.3	13.8	6.0	12.6
Parkersburg	15.6	13.1	6.0	11.2
Wheeling	15.5	14.0	6.0	12.2
Charlotte, N. C.	18.9	16.4	7.0	13.6
Hickory	19.4	16.9	7.0	13.0
Mt. Airy	19.2	16.7	7.0	12.8
Raleigh	18.5	16.0	7.0	12.1
Salisbury	19 0	16.5	7.0	12.7
Charleston, S. C.	17.5	15.0	7.0	11.1
Columbia	18.5	16.0	7.0	12.1
Spartanburg	19.2	16.7	7.0	12.9

*Standard of N. J. has discontinued posting service-station prices at all above points except at Washington where a station price of 16 cents is in effect.

Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gallons, consumer tank-wagon price at time and place of delivery; 100,000 gallons per year, consumer tankcar price plus .5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less .5 cent per gallon.

Effective May 15, 1937, in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax counties): Commercial consumers taking deliveries of 50 gallons (W. Va., 100 gallons) or more at one time will be billed at posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons (W. Va., 100 gallons) will be billed at 4 cents per gallon over posted consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price less .5 cent per gallon.

Discount for kerosene, 1 cent off tank-wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except no discount in New Jersey.

Southern District

STANDARD OIL CO. OF KENTUCKY

	Gasoline			Kero.
	Tank wag.	Net dir.	Inc. tax	tank-wag.
Atlanta, Ga.	21.0	18 0	7 0	*13 0
Augusta	19 5	16 5	7 0	*14.0
Macon	21.5	18.5	7.0	*14.5
Savannah	20.0	17.0	7.0	*12.0
Birm'ham, Ala.	21.0	18.0	8.0	12.0
Mobile	22.0	19.0	9.0	11.0
Montgomery	22.0	19.0	9.0	12.5
Jackson, Miss.	21.0	18.0	7.0	*13.0
Vicksburg	20 5	17.5	7.0	*13.0
Jacksonville, Fla.	20.5	17.5	8.0	11.0
Miami	20.5	17.5	8.0	†11.5
Pensacola	22 0	19.0	9.0	12.0
Tampa	21.5	18.5	8.0	11.0
Lexington, Ky.	20.0	17.0	6.0	11.0
Covington	19.5	16.5	6.0	11.0
Louisville	20.0	17.0	6.0	10.5
Paducah	20.0	17.0	6.0	10.0

Price basis to tank-wagon consumers: Effective January 4, 1937, 3 cents per gallon below tank-wagon price. Kerosene prices in all states subject to 2 cents discount except in Kentucky where prices are net.

*Includes 1-cent state tax. †Subject to 2-cent discount.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax; and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, and Tampa, Fla., have a city gasoline tax of 1 cent.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline		Kero.
	Dealer	Inc. tax	tank-wag.
Denver, Colo.	17.5	5.0	11.5
Grand Junction	20.0	5.0	15.0
Pueblo	16 0	5.0	10.5
Casper, Wyo.	18.0	5.0	11.5
Cheyenne	18.0	5.0	13.0
Butte, Mont.	19.5	6.0	15.5
Billings	21.5	6.0	15.5
Helena	21.5	6.0	15.5
Great Falls	21.5	6.0	15.5
Salt Lake, Utah	19.5	5.0	16.0
Twin Falls, Ida.	21.5	6.0	18.0
Boise	21.5	6.0	18.0
Albuquerque, N. M.	17.5	6.5	12.0

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline			Kero.
	Tank wag. con'r.	Di-vided dlr.	Inc. tax	tank-wag.
Ohio points	17 5	16 5	5.0	*13.5

*Includes state tax of 1 cent.

Divided dealer price is also price to authorized agents, exclusive of .5 cent rental. Tank-wagon price is price to commercial consumers in deliveries of 25 gallons or more; less than 25 gallons get service-station price.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline			Kero.
	Tank wag.	Serv. sta.	Inc. tax	tank-wag.
San Francisco	17.5	18.5	4.0	11.5
Los Angeles	17.0	18.0	4.0	9.0
Fresno, Calif.	18.5	19.5	4.0	12.0
Phoenix, Ariz.	21.0	22.0	6.0	‡16.0
Reno, Nev.	20 0	21.0	5.0	13.0
Portland, Ore.	20.0	21.0	6.0	13.5
Seattle, Wash.	20.0	21.0	6.0	13.5
Spokane	23.0	24.0	6.0	16.5
Tacoma	20.0	21.0	6.0	13.5

‡Includes 5-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents; to split dealers, 2 cents. To commercial consumers: on tank-wagon price: on single deliveries of 40 gallons and over, advance quantity discount extended at time of delivery, 3 cents. Service station schedule applies on single deliveries less than 40 gallons. On kerosene in tankcar, transport truck and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank-wagon.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline			Kero.
	Tank wag. dir.	Tank car con'r.	Inc. tax	tank-wag.
Albany, N. Y.	14.0	12.5	4.0	7.75
*Met. N. Y.:				
Manh't'n, Br'nx	13.5	12.0	4.0	7.25
Staten Island	13.75	12.0	4.0	7.25
Q'ns & Brklyn	13.5	12.0	4.0	7.25
Buffalo	14.3	12.67	4.0	8.25
Rochester	14.3	12.74	4.0	8.25
Syracuse	14.3	12.7	4.0	8.75
Boston, Mass.	14.0	12.5	4.0	7.50
Portland, Me.	15.8	13.5	5.0	7.75
Manch'ter, N. H.	16.3	14.0	5.0	8.00
Burlington, Vt.	15.9	13.9	5.0	8.75

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes.

Price basis to undivided dealer: Posted dealer tank-wagon price less .5 cent. Price basis to commercial consumer: Effective Nov. 15, 1936, monthly purchases of 25,000 gallons and over, consumer tankcar prices at delivery point plus .5 cent per gallon; monthly purchases of 5,000 to 25,000 gallons, undivided dealer price at delivery point: Monthly purchases under 5,000 gallons, pay divided dealer tank-wagon price at delivery point.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline			Kero.
	Tank wag.	Dir.	Inc. tax	tank-wag.
Omaha	18.4	16.9	6.0	10 4
McCook	18.0	17.6	6.0	10.0
Norfolk	18.8	17.3	6.0	10 8
North Platte	19.2	17.7	6.0	11 2
Scotts Bluff	19.9	18.4	6.0	10.9

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective Jan. 1, 1935.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline		Kero.
	Dealer	Inc. tax	tank-wag.
Muskogee, Ok.	15.0	5.0	7.0
Oklahoma City	15.0	5.0	8.0
Tulsa	14.0	5.0	7.0
Ft. Smith, Ark.	15.0	5.0	10.0
Little Rock	17.5	7.5	9.5
Texarkana	15.0	5.0	9.0

Texas

	Gasoline			Kero.
	Tank wag.	Serv. sta.	Inc. tax	tank-wag.
Dallas, Tex.	14.0	18.0	5.0	8.0
Fort Worth	14.0	18.0	5.0	8.0
Houston	14.5	18.5	5.0	8.0
San Antonio	14.5	18.5	5.0	8.0

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline			Kero.
	Tank wag. dir.	Tank car con'r.	Inc. tax	tank-wag.
N. Orleans, La.	20.0	17.5	*10.0	†14.0
Baton Rouge	18.0	15.5	8.0	12.0
Alexandria	18.5	16.0	8.0	12.0
Lafayette	19.0	16.5	8.0	12.5
Lake Charles	19.0	16.5	8.0	12.5
Shreveport	17.5	15.0	8.0	9.5
Knoxville, Tenn.	21.0	18.5	8.0	14.0
Memphis	19.0	16.5	8.0	12.0
Chattanooga	20.5	18.0	8.0	13.5
Nashville	20.0	17.5	8.0	11.0
Bristol	19.75	18.5	8.0	14.5

*Includes 2-cent parish tax. †Includes 1-cent parish tax and 1-cent state tax.

Standard of La. has transferred all stations to dealers except in New Orleans and Baton Rouge where station prices are 23.5 and 21.5 cents per gallon, respectively.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gallons or more in one delivery takes posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less .5 cent per gallon.

Louisiana kerosene prices include 1-cent state tax.

Pennsylvania, Delaware and Part of New England

ATLANTIC REFINING CO.

	Gasoline			Kero.
	Tank wag. dir.	Tank car con'r.	Inc. tax	tank-wag.
Philadelphia, Pa.	14.0	12.5	5.0	10.5
Pittsburgh	15.5	13.5	5.0	11.0
Allentown	14.5	13.25	5.0	11.0
Erie	14.5	13.0	5.0	10.0
Scranton	14.5	13.25	5.0	11.0
Altoona	15.5	13.5	5.0	11.0
Dover, Del.	14.5	....	5.0	11.0
Wilmington	13 5	....	5 0	11.0
Springf'ld, Mass.	14.8	....	4.0	7.5
Worcester	14 3	....	4 0	8.0
Hartford, Conn.	14.6	....	4.0	7.0
New Haven	14.0	....	4.0	7.0
Providence, R. I.	13.0	....	3.0	7.75

Atlantic has transferred all stations to dealers except in Philadelphia and Pittsburgh where prices are 17.5 and 20.0 cents per gallon respectively.

Price basis to undivided dealers—Dealer tank-wagon less .5 cent per gallon.

Consuming accounts not under contract—when made by tank-wagon in quantities of 50 gallons or over, dealer price.

Commercial accounts under contract—annual consumption 2,500 to 100,000 gallons per year, 1 cent above posted tankcar price; over 100,000 gallons per year, .5 cent above posted tankcar price.

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank-wagon*
Oleum spirits	15.7
V.M.&P. naphtha	16.0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax, but not 1-cent federal tax or 2 per cent retail occupational tax.

Prices f.o.b Chicago. Each price subject to discount of 1 cent per gallon for 150 gallon lots if covered by contract.

Canada*

3 Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Gasoline			Kero.
	Tank wag.	Serv. sta.	Inc. tax	tank-wag.
Hamilton, Ont.	22.0	....	6.0	17.0
Toronto, Ont.	22.0	24.5	6.0	17.0
Brandon, Man.	29.8	32.8	7.0	22.8
Winnipeg, Man.	28.2	31.2	7.0	20.7
Regina, Sask.	29.5	....	7.0	22.0
Saskatoon, Sask.	32.3	....	7.0	24.8
Edmonton, Alta.	30.5	33.5	7.0	24.2
Calgary, Alta.	28.0	31.0	7.0	21.5
Vancouver, B. C.	22.0	26.0	7.0	23.0
Montreal, Que.	19.0	....	6.0	17.5
St. John, N. B.	24.0	28.0	8.0	18.5
Halifax, N. S.	24.0	28.0	8.0	18.5

*Imperial gallon used in Canada.

Discount to dealers: Divided dealers pay 3 cents per gallon below station price; undivided dealers pay 4 cents per gallon below station price except in cities of Hamilton, Toronto and Montreal when discounts below station prices are one-half cent per gallon less and in Vancouver where discounts are 1 cent per gallon more.

Retail Price Changes

Continental Oil Co. May 11 advanced dealer gasoline 1 cent in Pueblo.

New York Market

(Continued from Page 215)

at northern points. Probably a representative index to the current fuel oil situation is given in last week's announcement by the Navy Department covering purchase of 4,903,929 bbls. of fuel oil for East and West Coast delivery. The prices involved ranged from 79 cents per barrel, which was Union Oil Co. of California's bid to supply 4,126,854 bbls. of the total, to $2.544 per barrel, covering a contract for 3,900 bbls. with Newport Oil Co.

The Navy Department also purchased 9,330,500 gallons of gasoline from several contractors at prices ranging from .101 to .237 per gallon. The top price of .237 per gallon applied to 8,000 gallons of East Coast aviation gasoline purchased from Humble Oil & Refining Co., and was for 100 octane fuel.

PRICES OF REFINED PRODUCTS

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of May 25, 1937

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 oct. and below (3d gr.)	.05⅛	.05⅜
63-67 octane	.05½	.05⅝
68-70 octane (regular)	.06⅛	.06¼
60-62 400 grades:		
62 oct. and below (3d gr.)	.05⅛	.05⅜
63-67 octane	.05½	.05⅝
68-70 octane (regular)	.06⅛	.06¼
64-66 375		.05¼
68-70 360	.05⅜	.05½

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.05⅛	.05⅜
63-67 octane	.05½	.05⅝
68-70 octane (regular)	.06⅛	.06⅝
60-62 400	.05⅛	.05¼
64-66 375	.05⅛	.05¼

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

U. S. Motor grades:		
62 octane and below		.05⅝
63-67 octane		.06
68-70 octane (regular)		.06½
62 octane and below		.05½

ARKANSAS (Ark., N. La., Miss. del.)—

U. S. Motor grades:	
62 octane and below	.05½
63-67 octane	.06¼
68-70 octane (regular)	.06½

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.05⅛	.05¼
63-67 octane	.05½	.05⅝
68-70 octane (regular)	.06⅛	.06¼
60-62 400 grades:		
62 octane and below	.05⅛	.05¼
63-67 octane	.05½	.05⅝
68-70 octane (regular)	.06⅛	.06¼
64-66 375	.05⅛	.05¼
68-70 360	.05¼	.05⅜

PENNSYLVANIA (Inland refineries)—

58-60 U. S. Motor:		
Below 60 octane		.05⅝
60-64.9 octane	.07	.07¼
65-70 octane	.07¼	.07½
64-66 375		.05⅝
68-70 350		.05⅞

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.07½	.08½
58-60 400, 65 oct. and higher	.08¼	.09¼

EAST COAST (domestic)—

U. S. Motor below 60 octane:		
*New York (Bayonne)		.06¾
Baltimore		.06¾
U. S. Motor, 60-64.9 octane:		
*New York (Bayonne)		.07
Philadelphia	.07	.07¼
Boston		.07¼
Baltimore	.07	.07¼
Charleston, S. C.		.07¼
U. S. Motor, 65 and above:		
*New York (Bayonne)		.07¼
Philadelphia	.07¼	.07½
Boston		.07½
Baltimore	.07¼	.07½
Charleston, S. C.		.07½

*All grades of gasoline one-eighth to one-fourth cent less for barge shipments. New York harbor prices are for New York and New England delivery. Prices for New Jersey delivery one-fourth cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane	.06	.06⅛
60-64.9		.06¼
65 octane and higher		.06½

Naphtha

PENNSYLVANIA (Inland refineries)—

50-52 450 (blending)	.05½
52-54 450 (blending)	.05½
54-56 450 (blending)	.05⅝

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.03½
Grade 18-55	.04⅛	.04¼

NORTH TEXAS—

Grade 26-70		.03½
Grade 18-55	.04	.04¼

CALIFORNIA—

75-85 375-390	.06¾	.07½

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

Grade 26-70	.03¾	.03⅞

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110 flash, 540-550 e.p.	.04⅛	.04⅜
41-43 gr., 300-350 i.b.p., 110-125 flash, 500-520 e.p.	.04¼	.04½
46-48 gr., 210-230 i.b.p., 480 max. e.p.	.04⅞	.05

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.04⅛	.04⅜
42-44	.04⅜	.04½

NORTH TEXAS—

41-43	.04⅜

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

41-43	.04½

ARKANSAS (Ark., N. La., Miss. del.)—

41-43	.04¾

PENNSYLVANIA (Inland refineries)—

45	.04⅝
46	.04¾
47	.04⅞

CHICAGO (Based on Group 3)—

41-43	.04⅛	.04¼
42-44	.04⅜	.04½

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04	.05

NEW YORK (Bayonne, N. J.)—

41-43	.05½

***GULF COAST (domestic)—**

41-43	.04¾	.05

*Barge price one-eighth cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

No. 1 prime white, 38-42	.03⅞	.04
No. 1 straw, 38-40	.03⅝	.03⅞
No. 2 straw, 32-36	.03½	.03⅝
No. 2 dark, 32-36	.03⅜	.03½
No. 3, zero to 15, 28-32	.03¼	.03⅜
No. 3, 15 and above, 28-32	.02½	.02¾

NORTH TEXAS—

No. 1 prime white, 38-42		.04
No. 1 straw, 38-40	.03⅝	.03⅞

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

No. 2, 32-36	.03⅜	.03½

ARKANSAS (Ark., N. La., Miss. del.)—

No. 2, 32-36	.03⅝	.03¾

CHICAGO (based on Group 3)—

No. 1 prime white, 38-40	.03⅞	.04
No. 1 straw, 38-40	.03⅝	.03¾
No. 2 straw, 32-36	.03½	.03⅝
No. 2 dark, 32-36	.03⅜	.03½
No. 3, zero to 15, 28-32	.03¼	.03⅜
No. 3, 15 and above, 28-32	.02⅝	.02¾

NEW YORK (Bayonne, N. J.)—

*No. 1	.05¾
*No. 2	.05⅝
*No. 4	.05⅛

*Barge deliveries one-eighth to one-fourth cent under above, tankcar price.

Gas Oil and Fuel Oil

(Gas oil per gal.; fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil	.02¾	.03⅛
No. 4, low cold test, 24-28	1.07½	1.12½
No. 4, 15 and above, 24-28	.90	95
No. 5, low cold test, 18-22	.87½	.90
Below 18 fuel oil, industrial	.80	.87½

NORTH TEXAS—

U.G.I. gas oil	.02¾	.03⅛
No. 4, low cold test, 24-28	1.07½	1.12½
No. 5, low cold test, 18-22	.87½	.90
Below 18 fuel oil, industrial	.80	.85

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

10-14 fuel oil, industrial	.80	.85

ARKANSAS (Ark., N. La., Miss. del.)—

10-14 fuel oil, industrial	.70

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02¾	.03
No. 4, low cold test, 24-28	1.07½	1.12½
No. 4, 15 and above, 24-28	.90	.95
No. 5, low cold test, 18-22	.87½	.90
No. 6, low cold test, 10-16	.80	.85

PENNSYLVANIA (Inland refineries)—

36-40	.04⅝	.04½

CALIFORNIA—

Los Angeles:		
30-34 gas oil, per bbl.	1.15	1.35
24 plus diesel, per bbl.	1.17	1.35
24 plus diesel (bunkers)	1.50	1.65
12-16 (bunkers at tidewater)	1.05	1.20
10-16 (cargo lots)	.95	1.10
12-17 (tankcars)	1.00	1.15
10-17 (high sulfur)	.60	.90
San Joaquin Valley:		
10-18 (tankcars)	.75	1.05
24 plus diesel, per bbl.	1.45	1.65
San Francisco:		
27 plus diesel		1.65
24 plus diesel (bunkers)		1.70
10-16 (bunkers)		1.20

GULF COAST—

28-30 gas oil	.03⅞	.04⅛
28-30 diesel (bunkers)	1.65	1.90
Bunkers (bulk cargoes)		.95
Bunker C (bunkers)		1.05

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04¾
28-30 diesel (lighterage 6¼c per bbl.)		2.10
28-30 diesel (tankcars)		.04¾
Bunker C (to ocean-going ships in N. Y. harbor)	1.35	1.50
Industrial fuel (tankcars)		.04½

*Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

Bright Stocks:	
190-200 D, 15-25	.23
150-160 D, 0-10	.20
150-160 D, 15-25	.19½
150-160 E, 15-25	.19
100-110 D, 0-10	.18
Steam refined:	
631 green (treated)	.17½
600 dark green (untreated)	.05

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 145-50 at 210, 540-550 flash):	
10 pour test	.28 .28½
15 pour test	.27 .27½
20 pour test	.26 .26½
25 pour test	.25 .25¼
Steam refined:	
600	.17
650	.19
600 Pennsylvania flash	.20
630 flash	.23½
600 Warren E filtered	.20

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

Zero to 10 Cold Test:	
150-3	.09
180-3	.10
180-4	.09½
200-3	.10½
200-4	.10
250-3	.11½
250-4	.11
280-3	.12½
280-4	.12
300-3½	.13
400-3½	.14
100-2½ paraffin oil	.05¾
15-20 Cold Test:	
200-3	.10
200-4	.09½
250-3	.11
250-4	.10½
280-3	.12
280-4	.11½

GULF COAST—

Pale Oils:		
200-3	.07	.07¼
300-3	.07½	.07¾
500-3½	.08⅛	.08¾
750-3½	.08⅝	.09¼
1,200-3½	.09½	.09¾
1,500-4	.09¾	.10
Red Oils:		
200-5-6	.07¼	.07½
300-5-6	.07¼	.07½
500-5-6	.08	.08½
750	.08¾	.09
1,200-5-6	.09¼	.09½

CALIFORNIA (moving to dom. market)

Pale Oils:		
100-2½-3	.07	.08
200-2½-3	.07	.08
300-2½-3	.07	.08
400-3-4	.09	.11
540-3-4	.09	.11
550-3-4	.09	.11
600-3-4	.09	.11
Red Oils:		
200-4-5	.07	.08
300-5-6	.07	.08
350-5-6	.10½	.11½
400-5-6	.10½	.11½
450-5-6	.10½	.11½
500-5-6	.10½	.11½
600-5-6½	.10½	.11½
700-6½ plus	.10½	.11½
750-6½ plus	.10½	.11½
900-6½ plus	.10½	.11½

PENNSYLVANIA—

150 vis. at 750° F. color, 400-405 flash:		
Zero pour test	.25½	.26
10 pour test	.24½	.25
15 pour test	.24	.24½
25 pour test	.23	.23½
180 vis. at 70° F., 3 color:		
25 pour test	.26	.26½
200 vis. at 70° F., 3 color:		
Zero pour test	.30	.30½
10 pour test	.29	.29½
15 pour test	.28	.28½
25 pour test	.27	.27½

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (a.m.p.) w.c. scale	.02¾

PENNSYLVANIA (Inland refinery)—

122-124 (a.m.p.) w.c. scale	.0265	.0270
124-126(a.m.p.) w.c. scale	.0270	.0275

NEW YORK—

Wax in bags fully refined:		
122-125 (a.m.p.) wax		.0445
125-127 (a.m.p.) wax		.0455
128-130 (a.m.p.) wax		.0480
130-132 (a.m.p.) wax		.0505
133-135 (a.m.p.) wax		.0535
135-137 (a.m.p.) wax		.0560
124-126 (a.m.p.) w.s.	.0250	.0255
124-126 (a.m.p.) y.s.	.0260	.0265
Petrolatum in barrels, carloads lots:		
Dark green		.01⅞
Amber	.02⅞	.03
Extra amber	.03	.03⅛
Lily white	.06⅝	.06¾
Snow white	.07¾	.07⅞
Cream	.05⅝	.05¾

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.05⅞	.06
60-62 400		.05⅝
61-63 390	.05⅞	.06
64-66 375	.06⅛	.06¼

LOS ANGELES—

U. S. Motor grades:		
53-55 octane		.04¾
55-65 octane	.04¾	.05
65-67 octane		.05
67-69 octane		.05¼
Above 69 octane	.05½	.06

KEROSENE

GULF COAST—

41-43 prime white	.04½	.05
41-43 water white	.04½	.05
44 water white	.04¾	.05

LOS ANGELES—

41-43 water white	.04½	.05

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.o.b. in bbls.)—

Cylinder Stocks:		
600 Warren E	.26½	.27
600 S.R. unfiltered		.24
630 S.R. unfiltered		.25½
600 flash, S.R.		.26½
630 flash, S.R.	.32	.32½
Bright Stocks:		
8 color	.32	.32½
6½ plus color in dilution		.31½

NEUTRAL OIL

200-3 color	.32½	.33
150-3 color	.29	.29½

PARAFFIN WAX

NEW YORK (prices per pound)—

123-126 a.m.p.	.04125
125-127 a.m.p.	.0425
128-130 a.m.p.	.0450
133-135 a.m.p.	.0525
135-137 a.m.p.	.0550
Crude scale:	
124-126 w.s.	.0260 .0270
124-126 y.s.	.0245 .0250

CRUDE OIL PRICES

Oklahoma, Kansas, North Central and East Central Texas

(January 28, 1937)

East Texas (May 22, 1937)*	$1.35
Van, Tex.†	1.10
Camp Hill, Tex.	1.27
Cass County, Tex.‡	1.25
Talco	.73
Altus and Tipton, Okla.§	1.20
Other fields (see gravity table).	

*All companies. †Humble Oil & Refining Co.; Pure Oil Co. ‡Texas Co. §Gulf Oil Co. Talco by Humble Oil & Refining Co.

West Texas

See gravity table.	
Pecos County*	.91
Pecos shallow†	.81

*Shell Petroleum Co., Gulf Pipe Line Co., and Humble Oil & Refining Co. †Shell Petroleum Corp.

Gulf Coast

(January 28, 1937)

Choctaw and Darrow, La.	See note below
Clay Creek, Tex.	$1.00
Garden Island, La.	1.37
Cleveland, Tex.	1.27
Hardin, Tex.	1.15
Tomball, Tex.	1.30
Lafitte, La.	1.24
Livingston, Tex.	1.27
Satsuma	1.20
Heyser, light (Nov. 1, 1936)	1.15
Heyser, heavy (Nov. 1, 1936)	.90
Placedo (Nov. 1, 1936)	.90
Welsh, La.	.98
Tepetate (La.) (Jan. 4, 1937)	1.12

Greta, Refugio, O'Connor, McFadden, Saxet, Segno, Taft, Tomoconnor and Plymouth take same gravity prices as Gulf Coast, Duval, Jim Hogg, Webb and Zapata counties, Texas, and Heyser and Placedo fields take Mirando gravity prices. Jennings, La., 5 cents lower than Gulf Coast prices on each degree. Segno, Texas, takes Gulf Refining Co.'s Gulf Coast prices. Choctaw and Darrow, Louisiana, posted for first time by Standard Oil Co. of Louisiana, start below 21 degrees at 90 cents, with 3-cent differential up to 25 gravity, then 2-cent differential up to 40 and above, $1.36.

Rocky Mountain States

(Effective January 28, 1937)

Iles, Colo., light*	$1.18
Iles, Colo., heavy*	1.12
Greybull, Wyo.*	1.30
Torchlight, Wyo.*	1.30
Grass Creek, Wyo., light.*†	1.30
Grass Creek, Wyo., heavy (Nov. 4, 1936)*†	.62
Hamilton Dome, Wyo. (Nov. 4, 1936)*	.57
Elk Basin, Wyo., light*†	1.30
Frannie, Wyo., heavy*	.62
Frannie, Wyo., light	.82
Hogback, N. Mex.*	1.33
Pondera, Mont. (Jan. 26, 1936)*	1.05
Salt Creek, Dutton Creek and Midway, Wyo., take Stanolind's Oklahoma prices on a gravity basis.	
Big Muddy, Wyo.†	1.23
Rock Creek, Wyo.†	1.20½
Lea County, N. M. (see West Texas gravity table).	
Artesia, N. Mex.	.90
Maljamar, N. Mex.	.90
Canon City and Florence, Colo.	1.10
Florence, Colo.	.98
Lance Creek, Wyo.	.97
Sunburst, Mont. (June 5, 1936)	1.20
Cat Creek, Mont.	1.40
Cut Bank, Mont.	1.35

*Stanolind Oil & Gas Co. †Ohio Oil Co. ‡Continental Oil Co. Cut Bank by Toronto Pipe Line Co.

Middle Western States

OHIO OIL CO.
(Effective January 28, 1937)

Lima	1.25
Illinois	1.35
Princeton, Ind.	1.35
Midland, Mich.	1.42
West Branch, Mich.	1.26
Buckeye (March 16, 1937)	1.39½
Arenac, Mich.	1.26
Muskegon, Mich.	1.00
Eastern Kentucky:	
Big Sandy River	1.42
Kentucky River	1.50
Western Kentucky	1.40

Midland, Mich., price posted by Simrall Corp. and Pure Oil Co. includes Greendale, Porter, Beaverton, Crystal and equal grades. West Branch and Arenac by Simrall Corp., effective January 29. Eastern Kentucky crude purchased by Ashland Refining Co., Ashland, Ky. Buckeye posted by Simrall Corp. and Pure Oil Co.

Southwest Texas

(January 28, 1937)

Pettus	1.37
Salt Flat, Darst Creek, Hilbig, Carroll Clark, Zoboroski	1.09
Luling	1.00
Lytton Springs	1.12

Saxet and Taft take same gravity table as Gulf Coast.

North Louisiana and Arkansas

Smackover, all grades	$ .90
Tullos and Urania	1.02
El Dorado East field	.90
Union County, Ark.	.90
Ouachita County, Ark.	.90

Eastern States

TIDE WATER PIPE LINE CO.
(Effective Feb. 24, 1937)

Bradford, Pa.	$2.67
Allegany, N. Y.	2.67

SOUTH PENN OIL CO.
(Effective Feb. 24, 1937)

Pennsylvania Grade Oil in National Transit Lines (Bradford field)	2.67
Pennsylvania Grade Oil in Southwest Pennsylvania Lines	2.42
Pennsylvania Grade Oil in Eureka Pipe Line lines	2.37
Pennsylvania Grade Oil in Buckeye Pipe Line lines	2.22
Corning Grade Oil in Buckeye Pipe Line Co.'s lines (Jan. 29, 1937)	1.42

PENNZOIL CO.
(Effective Feb. 24, 1937)

Pennsylvania Grade Oil in National Transit Lines:	
Group A — Includes Cochran, Franklin, Hamilton and Doolittle districts.	2.67
Group B — Includes Tidioute district.	2.66
Group C — Includes Turkey and Tidioute districts.	2.65
Group D — Includes Bear Creek and Porkey districts.	2.64
Group E — Includes Eldeneau, Bull Creek, Rough Run, Carbon, Dipner, Bredlin, McJunkin, Jameson, Kenerdell, Emlenton, Tiona, Lacey and Kinzua districts.	2.61

Price depends on lengths of pipe line haul to plant at Oil City.

PURE OIL CO.
(Effective Feb. 24, 1937)

Cabin Creek, W. Va.	2.37
Bradford Hollow, W. Va.	2.37
Kelly Creek, W. Va.	2.37

Canada

Ontario (Sept. 9, 1933)*	
Petrolia	$2.10
Oil Springs	2.17
Turner Valley, Alberta province (Dec. 16, 1936):†	
Clear naphtha	$2.60
Discolored naphtha, 65 gravity and higher	2.36
Discolored naphtha and crude oil, 40-40.9 gravity	1.55
Increasing 3 cents for each degree of gravity with top price for 64-64.9 gravity	2.27

These prices delivered field tankage.
*Imperial Oil, Ltd.
†Imperial Oil, Ltd., and Regal Oil & Refining Co. On crude oil alone British American Oil Co. posted above prices on December 9, 1936.

Mexico

Panuco*	$1.24

*In U. S. currency, f.o.b. ship, based on April spot market transactions.

Crude Prices by Gravities

	1 Oklahoma-Kansas	2 Oklahoma-Kansas	3 North and Central Texas	4 East Central Texas (Mexia district)	5 North Louisiana-Arkansas	6 Gray County, Texas	7 Hutchinson-Carson counties, Texas	8 Rodessa, Louisiana-Texas and Panola County, Texas	9 Conroe, Tomball, Raccoon Bend, Satsuma, Texas	10 Gulf Coast	11 Gulf Coast	12 West Texas except Pecos County, N. Mex.	13 Mirando district, Texas	14 Marion County, Texas	15 Government Wells, Texas	16 Anahuac, Texas	17 White Castle, Louisiana	18 Iowa, Louisiana	19 Cayuga, Texas
Bel. 18	....	....	....	....	....	....	....	....	....	$.90	....	....	....	....	....	....	....	....	....
18-18.9	....	....	....	....	....	....	....	....	....	.92	....	....	....	....	....	....	....	....	....
19-19.9	....	....	....	....	....	....	....	....	....	.94	....	....	....	....	....	$.92	$.94	$.84	....
20-20.9	....	....	....	....	....	....	....	....	....	.96	$.95	....	$.90	....	$.90	.94	.96	.86	....
21-21.9	....	....	....	....	....	....	....	....	....	.98	.98	....	.93	....	.93	.96	.98	.88	....
22-22.9	....	....	....	....	....	....	....	....	....	1.01	1.01	....	.96	....	.96	.98	1.01	.91	....
23-23.9	....	....	....	....	....	....	....	....	....	1.04	1.04	....	.99	....	.99	1.00	1.04	.94	....
24-24.9	....	....	....	....	....	....	....	....	....	1.07	1.07	....	1.02	....	1.02	1.02	1.07	.97	....
Bel. 25	....	$.98	....	....	$.90	....	....	$.93	....	....	....	....	....	$.90	....	....	....	....	$.88
25-25.9	....	1.00	....	....	.92	....	....	.95	....	1.10	1.10	$.78	1.05	.92	....	1.04	1.10	.99	.90
26-26.9	....	1.02	....	....	.94	....	....	.97	....	1.13	1.13	.80	1.08	.94	....	1.06	1.13	1.03	.92
27-27.9	....	1.04	....	....	.96	....	....	.99	....	1.15	1.15	.82	1.10	.96	....	1.08	1.15	1.05	.94
28-28.9	....	1.06	....	....	.98	....	....	1.01	....	1.17	1.17	.84	1.12	.98	....	1.10	1.17	1.07	.96
Bel. 29	$1.06	....	$.96	$1.03	....	....	....	....	$1.20	....	....	....	....	....	....	....	....	....	....
29-29.9	1.08	1.08	.98	1.05	1.00	....	....	1.03	1.22	1.19	1.19	.86	1.14	1.00	....	1.12	1.19	1.09	.98
30-30.9	1.10	1.10	1.00	1.07	1.02	....	....	1.05	1.24	1.21	1.21	.88	1.16	1.02	....	1.14	1.21	1.11	1.00
31-31.9	1.12	1.12	1.02	1.09	1.04	....	....	1.07	1.26	1.23	1.23	.90	1.18	1.04	....	1.16	1.23	1.13	1.02
32-32.9	1.14	1.14	1.04	1.11	1.06	....	....	1.09	1.28	1.25	1.25	.92	1.20	1.06	....	1.18	1.25	1.15	1.04
33-33.9	1.16	1.16	1.06	1.13	1.08	....	....	1.11	1.30	1.27	1.27	.94	1.22	1.08	....	1.20	1.27	1.17	1.06
34-34.9	1.18	1.18	1.08	1.15	1.10	....	....	1.13	1.32	1.29	1.29	.96	1.24	1.10	....	1.22	1.29	1.19	1.08
Bel. 35	....	....	....	....	....	$.96	$.91	....	....	....	....	....	....	....	....	....	....	....	....
35-35.9	1.20	1.20	1.10	1.17	1.12	.98	.93	1.15	1.34	....	1.31	.98	1.26	1.12	....	1.24	....	1.10	....
36-36.9	1.22	1.22	1.12	1.19	1.13	1.00	.95	1.17	1.36	....	1.33	1.00	1.28	1.14	....	1.26	....	....	....
37-37.9	1.24	1.24	1.14	1.21	1.16	1.02	.97	1.19	1.38	....	1.35	1.02	1.30	1.16	....	1.28	....	....	....
38-38.9	1.26	1.26	1.16	1.23	1.18	1.04	.99	1.21	1.40	....	1.37	1.04	1.32	1.18	....	1.30	....	....	....
39-39.9	1.28	1.28	1.18	1.25	1.20	1.06	1.01	1.23	1.42	....	1.39	1.06	1.34	1.20	....	1.32	....	....	....
40,over	1.30	1.30	1.20	1.27	1.22	1.08	1.03	1.25	1.44	....	1.41	1.08	1.36	1.22	....	1.34	....	....	....

Column 1—Companies posting are Barnsdall, Bell, Champlin, Continental, Cushing, Derby, Dickey, Eason, El Dorado, Empire, Falcon, Globe, Gulf, Johnson, Kanotex, National, Phillips, White Eagle, Stanolind, Sunray, Texas, Sun, Vickers and Wilcox.
Column 2—Anderson & Prichard, Carter, Cosco, Deep Rock, Magnolia, Mid-Continent, Pure, Rock Island, Shell, Sinclair, Skelly and Tide Water.
Column 3—All purchasers.
Column 4—Humble Oil & Refining Co. and Sinclair Crude Oil Purchasing Co.
Columns, 5, 6, 7 and 8—All purchasers.
Column 9—Humble Oil & Refining Co. and Sun Oil Co. Tide Water Oil Co.'s schedule starts at 35 degrees, $1.34 with 2-cent spread up to 40 and over at $1.44. (Raccoon Bend prices are for deep sand oil.)
Column 10—The Texas Co. (Gulf Refining Co. pays same prices up to and including 34 gravity, but continues its 2-cent spread up to 40 and over at $1.41.)
Column 11—Humble Oil & Refining Co., Sinclair Prairie Oil Marketing Co., Sun Oil Co.
Column 12—All purchasers.
Column 13—Humble Oil & Refining Co.
Column 14—Magnolia Petroleum Co.
Column 15—Sun Oil Co.
Column 16—Gulf Refining Co.
Columns 17 and 18—Shell Petroleum Corp.
Column 19—Tide Water Oil Co.

June 22 Osage Sale Includes 60 Tracts

A public auction of Osage oil leases will be held in the Kihekah Theater in Pawhuska, Okla., on Tuesday, June 22, commencing at 1:30 p.m.

Sixty tracts, each a quarter section of 160 acres, and comprising altogether 9,580 acres will be offered for sale. The list follows:

EAST SIDE

Tract No.	Description	Acreage
1	SE 18-20-12	160
2	NW 20-20-12	160
3	NW 34-20-12	160
4	NE 20-22-12	160
5	NW 20-22-12	160
6	SE 32-29-12	160
7	SW 5-21-11	160
8	SE 6-21-11	160
9	NW 25-23-11	160
10	NE 11-20-10	160
11	SE 11-20-10	160
12	NE 3-21-10	160
13	SE 3-21-10	160
14	SW 28-21-10	160
15	SE 29-21-10	160
16	NE 32-21-10	160
17	NW 33-21-10	160
18	NE 14-22-10	160
19	SE 14-22-10	160
20	NW 29-23-10	160
21	SW 29-23-10	160
22	NE 30-23-10	160
23	SE 30-23-10	160
24	SE 5-25-10	160
25	SE 10-22- 9	160
26	SW 11-22- 9	160
27	NW 14-22- 9	160
28	NE 15-22- 9	160
29	SW 20-22- 9	160
30	NE 3-24- 9	160
31	SE 3-24- 9	160
32	SW 3-24- 9	160
33	SE 8-24- 9	160
34	SW 8-24- 9	160
35	SE 9-25- 9	160
36	NW 15-25- 9	160
37	NE 16-25- 9	160
38	NE 34-25- 9	160
39	NW 14-29- 9	160
40	SW 14-29- 9	160
41	S½ NW¼ and N 60 acres N½ SW¼ 13-21- 8	140
42	SE 11-23- 8	160
43	NW 25-25- 8	160
44	SW 25-25- 8	160
45	NE 26-25- 8	160
46	SE 26-25- 8	160
47	SE 1-26- 8	160
48	SW 1-26- 8	160
49	NW 20-27- 8	160

WEST SIDE

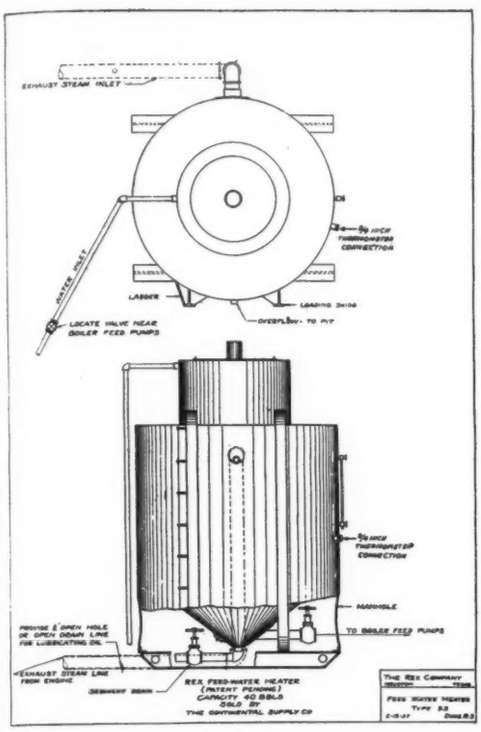
50	NE 14-26- 6	160
51	SE 7-24- 5	160
52	NE 18-24- 5	160
53	NE 4-26- 5	160
54	NW 4-26- 5	160
55	NE 26-29- 5	160
56	NW 26-29- 5	160
57	SE 26-29- 5	160
58	SW 26-29- 5	160
59	SE 4-25- 3	160
60	NE 9-25- 3	160
		9,580

W. W. Sullivan, former agent for the Gulf Refining Co. in Fort Worth, Tex., has been promoted to special traveling representative for the company, retaining Fort Worth as headquarters.

NEW OR IMPROVED EQUIPMENT

Preheater Takes Out Sediment Before Water Enters Boiler

Rex Co., Houston, Tex., has placed on the market, through Continental Supply Co., a new open-type feedwater-heater for use with oil-field boilers.



The Rex preheater was designed not only to provide ample boiler feedwater at 200 to 210 degrees, but to remove all sediment before the water is delivered to the boilers. It is claimed the boiler-tubes will remain clean longer, resulting in increased efficiency and reduction of maintenance costs. Provision is made for trapping and drawing off sediment that settles out of the water. Being an open-type heater, it liberates any oxygen dissolved in the water before it enters the boilers, thus eliminating the corrosive action of free oxygen on the boiler-tubes.

This preheater, utilizing exhaust steam from the engines, transfers heat directly from the steam to the water. The accompanying illustration shows the design and direction for installing the heater. There are no trays or hoppers to clean, and no leveling is required. A thermometer and two 4-inch screw-end valves are provided as standard equipment. Rugged construction is designed especially for oil-field use.

Bulletins, Booklets and Other Literature for the Trade

The M-S-A combustible-gas indicator is described in a bulletin prepared by Mine Safety Appliances Co., Pittsburgh, Pa.

A folder on nonsparking tools may be obtained by addressing a request to the Beryllium Corp. of Pennsylvania, Reading, Pa.

"Kirkuk in Pictures" is among interesting articles in the current number of Heat Engineering, published by Foster Wheeler Corp., 165 Broadway, New York. Views of the stabilization plant at the head of the Iraq pipe line in the Mesopotamian desert are given.

An illustrated 20-page bulletin, L-612-B3, offered by Worthington Pump & Machinery Corp., Harrison, N. J., gives information concerning the company's improved steam-driven compressors.

The latest issue of the Welder's Stabilizer, published by Lincoln Electric Co., Cleveland, Ohio, contains 28 pages of matter of live interest to welders.

Roller chain and sprocket catalog No. 607 has just been published by Diamond Chain & Manufacturing Co., Indianapolis, Ind. This 96-page book contains data on Standard roller chains ranging from three-eighths inch pitch through 2-inch pitch.

"Tips on Cable Uses" is the title of a bulletin prepared for distribution by General Electric Co., Schenectady, N. Y. It presents 20 types of cable and is designed to help in selecting the type best suited for each job.

Hanlon-Waters, Inc., Now Has Branch Office in Chicago

Hanlon-Waters, Inc., with general offices in the National Bank of Tulsa Building, Tulsa, manufacturer of equipment for production, pipe lines, gasoline plants, refineries, power plants and industrial plants, announces the opening of a Chicago office at 915 Old Colony Building. A. J. Foley, a graduate mechanical engineer of long experience in handling pressure and liquid-level control equipment for refineries, gasoline plants and other industrial

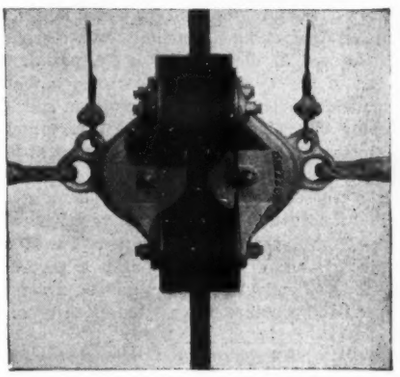
A. J. FOLEY

installations, will represent the company from the Chicago office as sales engineer, covering the eastern territory to the Atlantic seaboard.

No-Wip Line-Saver Is Addition to Grizzly Oil-Field Group

The latest member of the Grizzly oil-field products is the No-Wip line-saver. This new device is identified by the manufacturer, as neither a line-spooler nor a rigid line-guide. The No-Wip was engineered to reduce the expense and hazards of wire-line wear. These benefits are effected through a simple mode of operation, which is said to result in trouble-free functioning and long life on the part of the device itself.

In passing through the device the wire line comes in contact with six rubber rollers only, at no time touching metal. The top and bottom rollers



take out the whip, without straightening or injuring the line, while the side rollers help spool the line perfectly. At no time is there friction, stress, or strain on the line, according to the manufacturer, as the device floats with the line and the rollers spin freely at the slightest contact. This free spinning action results from the incorporation of two Norma-Hoffman precision-ground ball bearings in each roller, the bearings being packed in a Norma special-stability grease.

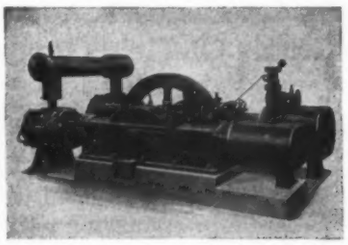
The freedom of operation eliminates many difficulties. The line cannot whip or pile up on the drum and is forced to track perfectly. When an empty block and elevator are being pulled up the usual bow and whip due to momentum are eliminated, permitting the line to spool perfectly without crawling or overlapping. All rollers, made of the toughest oil-resisting rubber compound, stand heavy punishment. The device can be installed at any point in the derrick, at any height over the drum, and it functions at any angle. It is manufactured by E. M. Smith Co., 600-650 South Clarence Street, Los Angeles, Calif.

Norman Dorn General Manager

Norman L. Dorn has been appointed general manager of Alexander Anderson, Inc., division of Lane-Wells Co., with headquarters in Fullerton, Calif. Mr. Dorn for 17 years has been connected with the drilling and production units of Shell Oil Co., for the past two years superintendent of its production department at Long Beach. In this capacity he had direct supervision of the production operations of the fields in Los Angeles Basin, Signal Hill, Redondo, Torrance, Dominguez, Inglewood, Montebello, Santa Fe Springs, Brea, Columbia and Huntington Beach.

Worthington Offers Improved Steam-Driven Compressors

Dual crosshead design, tierods that maintain all piston strains in exactly the same line with the connecting-rod, a uniform flywheel and counterweighted running gears are featured in the improved line of horizontal heavy-duty steam-driven



compressors offered by Worthington Pump and Machinery Corp., Harrison, N. J.

These compressors embody the simple lightweight feather-type valves which characterize all Worthington compressors and for which important advantages are claimed. Suction and discharge valves, located in the cylinder body, permit the full area of the cylinder-head to form a water-jacket, which cools the air and valves, in addition to keeping the valves free of carbon. Low power consumption is aided by the Admiralty metal tube intercoolers.

Early cutoff, provided by double-piston steam valves with adjustable riding cutoff valves, results in high steam expansion. The point of cutoff can be controlled either manually or by a governor. The automatic cutoff governor may be arranged as a speed-and-pressure or variable-speed type.

W. H. Pape in New Post

Crane Co., Chicago, has coordinated all its activities concerned with the estimating, engineering and sales of valves, fittings, pipe and fabricated piping into one unit, the valve and fitting department, with W. H. Pape as manager. Mr. Pape enters his new position with 25 years' experience which covers a wide range of industrial applications of Crane products. His first work was in heavy railroad construction, followed by similar work on New York subways. In 1914 he entered the oil industry, serving in turn as designer, operator and sales engineer. He joined the Crane organization in 1927 as special representative in New York and later in the Boston territory. For six years he was in the Oklahoma and Gulf Coast oil fields, and for the past one and one-half years manager of the oil sales department in the general office, Chicago.

Here and There With Men Who Manufacture Equipment

Samuel B. Robertson, recently elected president of B. F. Goodrich Co., is a director of Goodrich Silvertown Stores, the company's retail division; Miller Rubber Co., Inc., and B. F. Goodrich Rubber Co. of Canada, Ltd.

Mid-Continent Supply Co., with general offices in the Mid-Continent Building, Fort Worth, Tex., has opened a new store in Lisbon, La., with G. C. Colwell as manager.

Charles A. Flannery has been made sales manager of the fabricated plate division of Emsco Derrick & Equipment Co., Los Angeles, Calif.

W-K-M Co., Houston, Tex., has established a district office at 310 Thompson Building, Tulsa, to serve Oklahoma, placing W. C. (Bill) Morgan in charge. W-K-M's gate valves, rotary and tubing slips, and automatic mudscreens will be handled through the Tulsa office.

Directors of the Westinghouse Electric International Co. elected John W. White vice president and general manager. His headquarters will be in New York.

High Resistance to Crushing Is Feature of Goodyear Hose

New principles of construction applied to the manufacture of gasoline hose by the Goodyear Tire & Rubber Co. have resulted in two styles of product which are said to have many advantages from both economy and operation standpoints. The two new hose are identified as style W. W. H. and style B. H. The style W. W. H. is made with a synthetic-rubber inner tube, a woven jacket reinforcement having alternate steel wire and cotton yarn filler strands, and an outer cover of black rubber.

The reinforcement is similar to the jacket woven on fire hose except that alternate strands are of high tensile steel wire. The outer protective covering is tough compound native rubber. Outstanding among advantages of this hose is its high resistance to crushing. Even if crushed under abusive conditions, it may be pounded back into shape.

Style B. H. hose is made with a synthetic-rubber inner tube, three braids of high tensile cotton cord, and an outer black rubber cover same as used on style W. W. H. The B. H. product will resume its original shape after being crushed, is light in weight, extra-flexible and easy to handle. Both new hose have smooth bore, permitting rapid flow. The black rubber cover resists abrasion and is kept clean easily.

George Knipfel Transferred by Waukesha to Wichita, Kans.

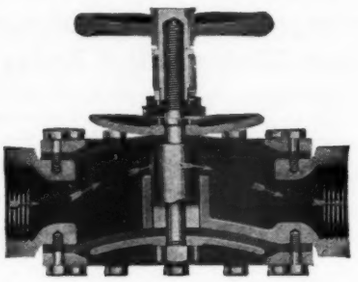
George C. Knipfel has been transferred from the Mid-Continent office of the Waukesha Motor Co. in Tulsa, to cover the Kansas territory as sales representative. Though Mr. Knipfel will work out of the Mid-Continent office, his headquarters will

GEORGE C. KNIPFEL

be in Wichita, Kans. He has been with Waukesha 12 years, 10 in the home office in Waukesha, Wis., and 2 with the Mid-Continent branch in Tulsa.

Foreign Matter in Liquids and Gas Handled by New Valve

A new balanced-diaphragm valve, developed and manufactured by McAlear Manufacturing Co., closes off tightly repeatedly, in service on liquids or gases containing foreign matter. Being balanced, it will open or close easily. There are no bellows

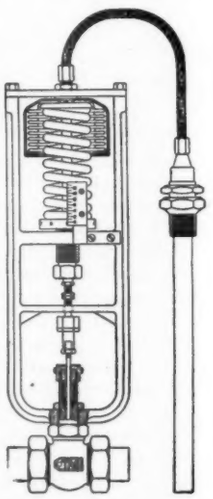


or stuffing-boxes, thus preventing friction. When used on throttling service there are no bad effects from wire-drawing.

This valve need not be removed from the line to change the diaphragm, which can be supplied in various compositions to take care of air, water, gas, acids, or alkalis. Made of either ferrous or nonferrous materials, it can be suitably lined for all acids and alkalis, hot and cold. It will operate in any position, is not damaged from freezing, and can be either hand- or motor-operated. It is made in 2-inch and larger sizes.

Improved Line of Temperature Controllers Offered by Tag

C. J. Tagliabue Manufacturing Co., Park and Nostrand Avenues, Brooklyn, N. Y., announces improvements in its line of self-operating temperature controllers. These improvements include an entirely new design of flexible seamless metal bellows and numerous minor refinements of design, material and workmanship.



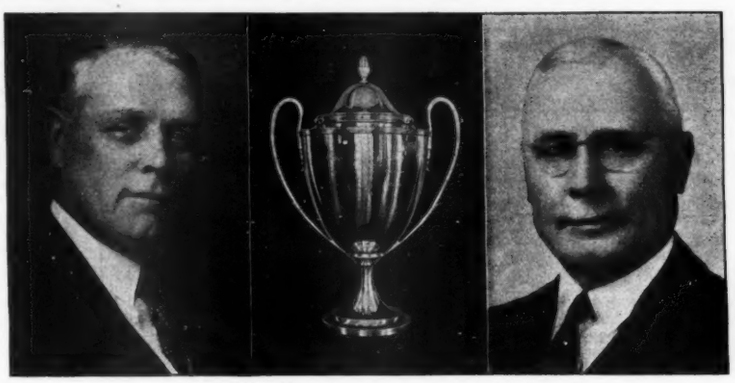
The new model is suitable for industrial applications where the close control obtainable with auxiliary power is not necessary or where the steam pressure available is less than 10 pounds per square inch (necessary for opening the Tag steam-operated controller). Temperature ranges are approximately 75 degrees between the limits of 30 degrees F. and 450 degrees F. The valves are semibalanced, in sizes from one-half inch to 2 inches.

Hour Meter Standard Equipment

An hour meter will be standard equipment on all 3-, 4- and 6-cylinder diesel engines produced by the Caterpillar Tractor Co. This meter was made available as an attachment about two years ago. The manufacturer says its use will means as much eventually to the diesel engine owner and operator as the speedometer does to the automobile owner. The hour meter, a sturdy unit with a large easy-to-read dial, is attached to the rear of the fuel injection pump housing. It is driven by the end of the shaft, fitting between the heads of the cap screws in the end of the fuel injection pump camshaft. The meter registers one number for every hour the engine operates at standard rated speed.

SUPPLY VETERANS RECEIVE CUPS ON ANNIVERSARY

Forty years of service recently was completed by the Parkersburg Rig & Reel Co., Parkersburg, W. Va., and in commemoration of the occasion the employes presented silver loving cups to John M. Crawford, founder of the company, and David B. Crawford, president, as tokens of their loyalty and affection. The presentation ceremony, attended by the department heads from the general offices and plant foremen, came as a surprise to both recipients. Casper A. Ruf, vice president and general manager, and Bernard M. Farson, secretary and treasurer, made the presentations. John M. Crawford and David B. Crawford are among the supply industry's widely known figures. From the time they began their careers as salesmen in the Pennsylvania fields the two have served a total of almost 100 years in this branch of the oil business. A special issue of the Parkersburg Rig and Reel Magazine, telling of the company's part in developing equipment for the oil industry, was published in connection with the company's anniversary.



David B. Crawford and John M. Crawford

Oil and Paraffin Are Removed by New Sucker-Rod Stripper

A new sucker-rod stripper placed on the market by the Guiberson Corp., Dallas, Tex., is designed to remove oil and paraffin from sucker-rods and couplings and to prevent escape of gas and oil when rods are being run in or out of the well. It is said to make the nastiest "wet job" cleaner than any ordinary well-pulling operation.

The tool provides a leakproof seal under pressure. It is rated at 400 pounds working pressure, and sucker-rods have been pulled without loss of oil or gas under pressures exceeding 400 pounds. This makes it possible safely and easily to remove sucker-rods from a well that has started flowing after being brought in on the pump or a well with a large volume of gas that has a tendency to build up heads and flow intermittently. The rubbers providing the packoff are extremely flexible and will allow passage without leakage of any pump, pump-plunger, or sucker-rod splicers that can be run in 2½-inch tubing. The device consists of only four parts. There are no pins, bolts or other small pieces. The rubber, made in halves, is inserted in the housing. A compression-plate goes over the rubbers inside the housing. The cover-plate screws onto the housing by means of a coarse thread and compresses the rubber, sealing it around the rod as well as the inside of the housing. The cover-plate is provided with holes into which a bar or chain tong handle may be inserted to facilitate screwing it down on the housing.

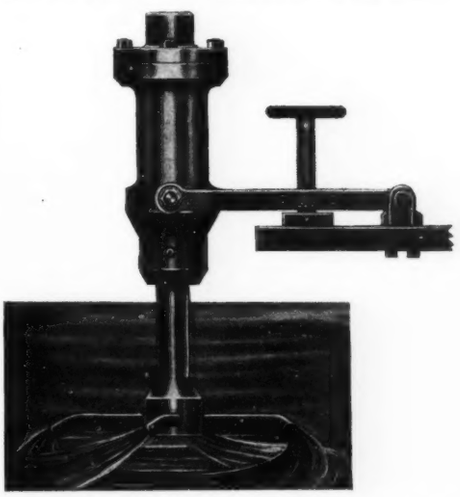
The face of the rubber contacting the sucker-rod as well as the outside of the rubber which contacts the housing is deeply fluted horizontally, or circumferentially, which gives it the wide range of expansion and contraction necessary. Two sizes of rubbers are available. One size is for one-half, nine-sixteenths or five-eighths inch rods, the other for three-fourths, seven-eighths or 1-inch. The housing is provided with a female 2½-inch A.P.I. plain tubing head.

Wickwire Spencer Reorganized

Ending one of the longest industrial receiverships on record, the Wickwire Spencer Steel Co., producer of specialty wires and wire products, announces dissolution of the trusteeship under which it has been operating and the formation of a new company under the same name. In October, 1927, E. C. Bowers and C. L. Feldman were appointed receivers of the Wickwire Spencer Steel Co. which had been formed in 1920 by the combination of the Wickwire Steel Co. of Buffalo, N. Y., and the Clinton-Wright Wire Co. of Worcester, Mass. After continuing for seven years, the receivership was changed to a trusteeship on July 31, 1934, and the company reorganized on May 1 of this year.

Bowen Co. Mud-Mixer Made to Prevent Well Blowouts

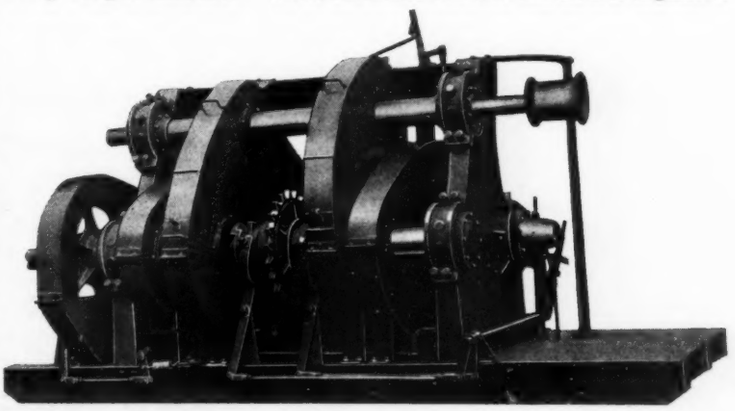
Bowen Co. of Texas has introduced the Bowen mud-mixer, designed to keep a correct mixture of the elements used in drilling fluid to insure proper viscosity, weight or other desired characteristics, thus preventing blowouts. This mud-mixer maintains a uniform and constant suspension of the materials used and with available attachments it serves to introduce weight, viscous or chemicals (including tannic acid) into the drilling fluid. In practice it is suspended reasonably close to the suction directly over the mud-pit, with the mixing nozzles slightly submerged. This prevents aeration. It is possible to raise or lower the tool to compensate for changes that may occur in the fluid level of the mud-pit. It requires no attention other than occasional lubrication and may be operated continuously or at intervals according to well conditions.



OILTIGHT CHAIN-HOUSINGS FEATURE DRAWWORKS

Wheland Co. is introducing a new Wheland-Lucey drawworks featuring oiltight chain-housings which form oil reservoirs and through which chains run constantly. Increased life of chains and sprockets is said by the manufacturers to be an advantage resulting from this feature. The drawworks has three shafts. Sprockets and clutches are so arranged that four hoisting speeds and two rotary-table speeds are available. The drumshaft is 8 inches in diameter, lineshaft 7½ inches, and jackshaft 7½ inches. All shafts are mounted on heavy-duty American roller bearings.

Completely unitized side housings are solid cast-steel with bearing-boxes cast integral. This sturdy construction, according to the manufacturer, minimizes vibration and assures alignment.



The brake flanges are water-cooled and the brakes are the standard Wheland-Lucey compounded type, designed to hold the longest strings of pipe with minimum effort on the part of the operator, and are of special value in deep fields.

CLASSIFIED ADVERTISING

Patent Attorneys

JACK A. SCHLEY
PATENT LAWYER
Patents Obtained—Infringement practice in all Courts—oil field experience. 1807-11 Tower Petroleum Bldg., Dallas. 1614 Second Nat'l. Bank Bldg., Houston. 707 Insurance Building, San Antonio. 433 Munsey Building, Washington, D. C. Address any of these offices.

REGISTERED PATENT ATTORNEYS
United States and Canada
Before disclosing your invention to any one, send for blank form:
"Evidence of Conception."
Instructions "How to Establish Your Rights" and complete information FREE!
LANCASTER, ALLWINE & ROMMEL
418 Bowen Building,
Washington, D. C.

Incorporations

CHARTERS — Delaware best, quickest, cheapest, most liberal. Free forms. Colonial Charter Co., Wilmington, Del.

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Petroleum Eng. Laboratories

GEOLOGIC STANDARDS COMPANY
1600 East 5th Place, Tulsa, Oklahoma.
Porosity-Permeability-Saturation Tests.

Mailing Lists

ROYALTY INVESTORS from pipe line records. Lease investors. Oil Industry Mailing List Co., 909 Tulsa Loan Building, Tulsa, Oklahoma.

Situations Wanted

PETROLEUM Engineer, University graduate, twelve years' experience in land, geological and engineering departments, desires connection with a reliable company. Can furnish best of references. Address Box H-730 The Oil and Gas Journal, Tulsa, Okla.

MECHANIC and engine setter of all types of machines. Fully experienced, best of references, sober. Address Box H-761, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER. Young, 12 years experience Oil Refinery Design, Layout and Construction. Have worked in the Far East and Latin America. Location no preference. Address Box H-794, The Oil and Gas Journal, Tulsa, Okla.

EXECUTIVE

Oil executive with exceptional 16 years' record established in the principal branches of the industry seeks new connection with progressive major or independent company. Thoroughly experienced in production, transportation, crude marketing and purchasing, land work, acquisition of properties and companies, consolidations, public relations, industrial relations, group contracts, and legislative work, both national and local.

Recent and current activities embrace tax and legislative work with state and federal administrations, state assemblies, and Congress. Has served as chairman of state code and gasoline tax evasion committees, secretary of prominent oil trade association and assistant to the director of a national program cooperatively sponsored by the oil industry.

Health, personality, and capabilities of the best. Can furnish impeccable financial and personal record and unlimited references from leading company executives. This advertisement published with full approval of present employers. Address

BOX H-781
The Oil and Gas Journal
Tulsa, Oklahoma

GENERAL SUPERINTENDENT of skimming and cracking plants available in near future. Thoroughly experienced and can give good references. Address Box H-802, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

PETROLEUM REFINERY ENGINEERS

An Eastern engineering and construction company of long established reputation in the petroleum refining industry requires an engineer with technical training and practical experience in refining to supervise designing, drafting and selection of materials for refining equipment. Knowledge of process designing, refinery operation and mechanical engineering is essential.

For another position we require an engineer with sales ability to present our processes and equipment to the industry and to enter negotiations for contracts. Necessary qualifications are refinery experience, ability to analyze refinery requirements and processes and to be personally acquainted in the industry.

For both positions we wish men 28 to 40 years old, of good appearance with executive ability, willing to work, to study and to travel.

Your reply should include an outline of your education, experience, personal history, salary expected and a photograph, if available. Communications will be held absolutely confidential. Ample time will be allowed in which to receive replies before any selection is made.

An excellent opportunity exists for substantial advancement.

Address reply to Box H-800, The Oil and Gas Journal, Tulsa, Oklahoma.

Help Wanted

REPRESENTATIVES wanted, principal towns Mid-Continent field, for live Coast oil weekly newspaper. Combination reportorial, subscription, advertising work. Exclusive franchises, excellent remuneration. Write National Oil Derrick, 900 Spring Arcade Building, Los Angeles, Calif.

OPERATORS AND HELPERS WANTED for new refinery in Texas. Must have had experience with Dubbs Cracking and Reforming Vacuum and Atmospheric distillation. Give particulars in first letter. Address Box H-790, The Oil and Gas Journal, Tulsa, Okla.

WANTED—Young mechanical engineer with experience in the design of surface pumping equipment. Will consider man with experience in other fields of design. Give experience, references and salary expected. Address reply to American Mfg. Company, Box 710, Ft. Worth, Texas.

For Sale—Maps

Any West Texas County Map, 36x42 showing sections, blocks and surveys, $2.00. Oil City Map Co., Ft. Worth, Texas.

OIL MAPS

MAJOR CO. wildcat blocks, pools, etc. New Mexico 1937, colored 50c. BROOKS BROS., 350 Clay, Los Angeles.

For Sale—Maps

SOUTHWESTERN UNITED STATES
Includes all of following states: Texas, Louisiana, Mississippi, Arkansas, Oklahoma, Kansas, also Eastern New Mexico. Shows all oilfields by name and location. Alphabetically arranged list on margin of all discoveries these States during 1936. Lithographed. Size 3 x 4 ft. $1. Same map with pipe lines to date, white print with blue lines $7.50. Send for illustrated catalog describing 400 ownership and field maps in Texas and Louisiana.
ZINGERY MAP COMPANY
Houston, Texas

SUCCESSFUL OIL OPERATORS
Are Using
ZINGERY OIL MAPS
Our Up-to-Date Lease and Fee Ownership Maps of Counties and Combination Development Maps Save Time and Money.
WRITE FOR DESCRIPTIVE FOLDER
1937 Revised Edition Map of State of Texas, eastern N. M., parts of southern Okla., SW Ark. and La. shows Oil and Gas Fields in color, Counties and County seat and elevations, co-ordinated alphabetical index of fields and counties.
Price $1.00 postpaid
ZINGERY OIL MAP COMPANY
Fair Building Fort Worth, Texas

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	*1 time*	*$5.00*	
1 Inch	*13 times*	*4.50*	*per inch*
1 Inch	*26 times*	*4.00*	*per inch*
1 Inch	*52 times*	*3.50*	*per inch*

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

CLASSIFIED

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgement is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.55*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

Royalties—Production

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Securities and Exchange Commission. Inquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

PRODUCING OIL ROYALTIES
15 years of experience
L. H. WITWER
214 Kennedy Bldg., Tulsa, Okla.

ROYALTIES PURCHASING TRUST, LTD., Moorgate Hall, Moorgate London, E. C. 2., England, are buyers of producing oil royalties.

HIGH GRADE producing oil and gas royalties offered to dealers. Billie Smallwood, P. O. Box 2261, Tulsa, Oklahoma.

Oil Royalties and Oil and Gas Leases
Bought and Sold
E. T. Marion
1109 Petroleum Building
Midland, Texas

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

F. A. SANSOME
Maintains a Complete Trading Organization for Brokers, Banks and Dealers
In
Oil Royalties
522 Fifth Avenue, New York, N. Y.

PRODUCING OIL ROYALTIES
for dealers
H. P. BOWEN
842 Kennedy Bldg., Tulsa, Okla.

NEW MEXICO Oil and Gas Leases and royalties. Send 50 cents in stamps for new State Oil Map of New Mexico. Roy G. Barton, Clovis, New Mexico.

Ranches and Farm Lands

350 ACRE irrigation farm and an adjoining 3,469 acre pasture land for sale. Railroad loading shed in center of farm. County highway passes along side of farm. Location 20 miles northwest of Laredo, Texas. Write to JOHN DAVIS, Joyce, Webb County, Texas.

MINNESOTA $40,000. Ranch. 965 acres on lake and river, 40 miles Minneapolis and St. Paul; 100 acres timber pasture, 350 acres cultivated. Got on foreclosed Mgt. $44,000. Improvements worth 16,000. Tiled. Valued at $80,000 when loan was made, now clear. Terms on $14,000. Take undrilled oil lease or interest in prospective lease up to $20,000. 2515 Lyndale Ave. So., Minneapolis, Minn.

Financing

CAPITAL SEEKERS—Put your project before 260 Key-Men. Cost trifling. Details free. Amster Leonard, Fox Theater Building, Detroit, Michigan.

CAPITAL raised for development of Oil and Mining properties. Delaware Charters. J. B. Murrow, 299 Broadway, New York.

CAPITAL raised for development of oil and mining properties and financing of industrial propositions. Individual or corporation, $25,000.00 or more. Write us your requirements. Confidential. Address Box H-803, The Oil and Gas Journal, Tulsa, Okla.

For Sale—Equipment

WELDERS A.C. and D.C. electric motor and engine driven. Reconditioned. Service Co., 3732 Cedar Ave., Cleveland, Ohio.

FOR SALE: 75—10" Standard cast iron gasket type flange unions, new and reconditioned—cheap. I. T. I. O., Bartlesville, Oklahoma.

FOR SALE: 15—3' x 15' National Tank Company sand hogs—cheap. I. T. I. O., Bartlesville, Oklahoma.

15,000 feet 4" O.D. 7¾ pounds per foot SEAMLESS LINE PIPE.
LARGE STOCK ALL SIZES OF PIPE.
Write, Wire or Phone For Prices
L. B. FOSTER COMPANY
P. O. Box 1647
Pittsburgh, Pa.

FOR SALE: Several used reconditioned Hughes plunger lift units complete for use with 7" casing and 2⅜" OD or 2⅛" OD tubing. I. T. I. O., Bartlesville, Oklahoma.

FOR SALE: 25,000' of new 2⅜" OD 10 thread 5.73-lb external upset Pittsburgh seamless steel tubing reamed for Hughes plunger lift. Located at our Oklahoma City warehouse. I. T. I. O., Bartlesville, Oklahoma.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air compressor, Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St. Cincinnati, Ohio

—TRACTORS—

NEW 10 ton US Gov., Caterpillar Crawlers $695 each, with winch $795. Also 5 ton size, $375.

O. C. Evans, Mt. Sterling, Ky.

FOR SALE: A large stock of McEvoy hand operated blowout preventers. I. T. I. O. Company, Bartlesville, Oklahoma.

USED ROTARY EQUIPMENT FOR SALE

2—125 H.P. 250 lb. W.P. Acme Boilers
1—100 H.P. 250 lb. W.P. Acme Boiler
2—125 H.P. 250 lb. O.W.S. Boilers.
3—100 H.P. 200 lb. W.P. Brodrick Boilers.
1—5 C.3 Unitized Draw Works.
1—6 in. Lucey Unitized Draw Works.
1—20 in. Denver-Gardner Mud Pump.
1—16 in. Johnson Mud Pump.
1—14 in. Johnson Mud Pump.
1—14 in. Ideal Mud Pump
1—27½ in. Lucey R. B. Rotary Table.
2—No. 10 Ideal Rotary Tables.
1—Type B—Regan Crown Block.
1—66 in. Union Tool Traveling Block.
1—72 in. Johnson Tool Traveling Block.
1—12 x 12 Johnson Engine.
2—12 x 12 Ideal Engines.

Also Miscellaneous Drilling, Fishing and Rigging up Tools, Fittings and Boilerfeed Pumps—Located in Oklahoma and Kansas. Communicate with

MidCo Tool & Supply Co.
Box 1542,
OKLAHOMA CITY, OKLA.

For Sale—Equipment

Steel Storage Tanks

50—Practically new 80,000-bbl. steel roof tanks, latest type.
125—55,000-bbl. storage tanks at great saving. Prices quoted on request for tanks standing, cut down, or reerected on your grade. Have all other sizes available. All tanks strictly guaranteed.

All kinds refinery equipment, valves, fittings, machinery, pumps and pump repair parts.
Wire—Phone—Write—W. C. Berry

SONKEN-GALAMBA CORPORATION
64 North Second St. Kansas City, Kansas

2—200 HP Ingersoll-Rand horizontal duplex gas engine driven gas compressor units, 2 Stage Imperial Type 10 G. Also meters, pumps and sundry high and low pressure fittings, pipe and etc. at Saticoy Gasoline plant. M. J. Dwyer, 3790 S. Vermont Ave., Los Angeles, California.

FOR SALE — National No. 3 Machine with shear poles, string of tools 15 to 6 inches complete. Steam unit located in Jack County, Texas. GLED OIL COMPANY, Tulsa, Oklahoma.

FOR SALE 1 Climax R6U, 142 H.P. GASOLINE POWER UNIT. Complete with Twin Disc clutch. P. A. Henault, Book Building, Detroit, Michigan.

A COMPLETE 1200 bbl. capacity GASOLINE REFINERY located in Shreveport. Formerly operated as the Griswold Refinery or the Cedar Grove Refinery. Apply J. E. Slattery, 1022 Slattery Building. Office Phone 7564, Shreveport, La.

FOR SALE complete equipment of two wells, consisting of derricks, oil well pumping unit, tanks, two gas engines, casing, rods, tubing, line pipes, fittings and etc. Address Peru Oil & Gas Co., Inc. 510 Insurance Bldg., Oklahoma City, Okla.

FOR SALE: Before moving machine shop to new location, selling our entire stock used pipe, casing, valves, pipe connections, pumps, etc. Elliott Machine & Supply Co., Depew, Okla. See A. D. Elliott.

FOR SALE: Standard Engineering 8" pipe cutter and threader with complete set of dies and taps. Will sacrifice. Highway Trailer Company, Edgerton, Wisconsin.

LUBE PLANT
CENTRAL MID-CONTINENT AREA. Complete equipment for Asphalt or Paraffin Base Crude, with several types available. On R. R. siding. Address communications to Box H-801, The Oil and Gas Journal, Tulsa, Okla.

10 SHARPLES SUPER-CENTRIFUGES, type M4 P5 Q10 complete with 3-HP G. E. Induction motors in extra good condition ready for immediate operation—also spare bowl and 6 spindles. Located at Bradford, Pennsylvania. Address Bradford Oil Refining Company, Bradford, Pa.

FOR SALE: Two Cameron No. 5 six stage centrifugal pumps, one with 500 h.p. GE motor, 30,000 bbl. 24 hours, with 600 h.p. GE motor, 35,000 bbl. 24 hours, synchronous motors with panel boards, good condition. MAX ZEIGLER & BROS., Muncie, Indiana.

FOR SALE: 6 class C-10 Sullivan pump heads with 15' stroke used in Oklahoma City operations. I. T. I. O., Bartlesville, Oklahoma.

For Sale—Equipment

FOR SALE: Before moving machine shop to new location, selling our entire stock used pipe, casing, valves, pipe connections, pumps, etc. Elliott Machine & Supply Co., Depew, Okla. See A. D. Elliott.

FOR SALE—3 Westinghouse single tandem double acting horizontal gas engines 750 HP, 150 RPM each one direct connected to 625 KW General Electric Generator; also 3 Westinghouse twin tandem double acting horizontal gas engines 600 HP, 180 RPM each one direct connected to 400 KW General Electric Generator. Engines and generators will be sold together or separately. Also 3 Ingersoll-Rand compressors, 3 Platt pumps, and other miscellaneous power house equipment including distribution board, power panels, etc. ROBERT H. REDFIELDS, Smethport, Penna.

FOR SALE
Complete compressor plant in good running condition, located in Nowata Field. 40-HP Clark Gas Engine, direct connected to 11¼x7¼x20 single action tandem compressor, and all connections.
16x32 Braden Steel building.
Price: $2,000.00
D. P. Oak,
611 Mayo Bldg.,
Tulsa, Oklahoma.

FOR SALE: LEVI SMITH REFINERY
Clarendon Pa. Address inquiries
Penn-Reserve Oil Co. L. G. Lockward, Sec.
48 Arlington Ave., Caldwell, N. J.

WRECKING
USED REFINERY MATERIAL FOR SALE
We have purchased the refinery of the Atlantic Refining Company at Pittsburgh, Pa., and will dismantle the same. We have for sale large quantities of pipe, valves, condensers and tanks of all sizes and description, cracking stills, belt conveyors, water towers and refinery equipment.
ROSEN WRECKING COMPANY
Atlantic Refining Plant
Butler Street
Pittsburgh, Pa.

Equipment Wanted

WANT TO BUY two old style, 35 H. P. Superior, two cycle Gas Engines. Quote condition, price and location. SANDERS & MURCHISON, Athens, Texas.

WANTED: 1 Pipe Line Pump—capacity 80/100-bbls. per hour against 500-lbs. pressure, preferably motor driven. Also, 1 Air Compressor, 200 cu. ft. per minute, 100-lbs. pressure. Address Bradford Oil Refining Company, Bradford, Pa.

Leases—Production

I OWN 480 acres in fee next to Sisne well in Wayne County, Illinois. Will make more liberal lease than any other owner. S. M. Homan, 7205 Exchange Ave., Chicago.

WHY WASTE TIME

and money dickering around when you can reach your prospects through the medium they have chosen themselves?

An advertisement in these columns will place your message before the wealthiest and most progressive group of men in the world—*OIL MEN*—the readers of The Oil and Gas Journal.

Put the Journal on your payroll—make it a part of your sales force. It will outsell anything you have tried before.

Classified Department

The Oil and Gas Journal
TULSA, OKLAHOMA

Leases—Production

NEW MEXICO—My weekly scout report furnishes complete and reliable information on New Mexico developments. Send for copy. W. S. Patterson, Santa Fe, New Mexico.

New Mexico OIL LEASES WHOLESALE
40 acres at a time.
Roy G. Barton, Clovis, New Mexico.

LEASES near Paluxy-Trinity sand Oklahoma Ordovician tests now drilling where there is chance for 50 to 1 return few weeks. E. CROFT, Proctor, Texas.

Specializing leases twenty acres up dollar acre, East Tex., La., S. Ark. Owners—Attorney. Box 1122, Little Rock, Ark.

LANDS Leases, Royalties, anywhere, bought, sold. Lands, $2 acre up. Leases 25c acre, up. Advise needs. American Investment Co., Houston, Texas.

980 ACRES YOAKUM CO., TEXAS
OIL AND GAS LEASE for immediate sale, consisting of Sec. 596 and W½ Sec. 597 in active developmental sector. Submit maximum offer to owner. Dr. J. A. Robinson, National Military Home, Los Angeles, Cal.

LEASES and ROYALTIES
Kearny County, Kansas
BEYMER & BEYMER, Lakin, Kansas

WILL BUY prospective oil lease, or not less than ¼ interest in not less than 40 acres in Kansas. Will furnish capital to develop. Write 2515 Lyndale Ave., South Minneapolis, Minn.

SOUTH TEXAS oil and gas leases. New 88 form with low rentals. Dealers or brokers only. H. H. WHITE, P. O. Box 674, San Antonio, Texas.

WELL WANTED—On 1,000 acre block in Permain Basin, Texas, South-East of Howard-Glasscock pool. Howard-Glasscock has produced 60,000,000 bbls. past six years. Major company recently paid bonus for extention of lease near this block. Will give 6/8 of oil and gas under block for well to go 2,700 feet. Good possibility commercial production at less than 2,000. Address Box 1082, Austin, Texas.

AM ready to figure with you on your bargains in Lands in fee or any type of Oil properties to buy or sell. My thirty years in this business here enables me to know values large or small. E. B. REEVES, Box 475, McLean, Gray County, Texas.

OPERATOR needs to drill two wells in shallow oil and wet gas field. Will sell close in leases cheap. Box H-804, The Oil and Gas Journal, Tulsa, Oklahoma.

PARTY to drill wildcat well. Have geologist report and map. 1,000 acres or more in Petroleum County, Montana. 415 North Fifth Street, Great Falls, Montana.

WANTED: Stripper oil production or wells or leases that are ready for salvage. Address Box H-724, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL and Gas Leases and Royalties, some producing and some near drilling wells. In the Permian Basin of West Texas and Lea County, New Mexico.
C. E. POYNOR
Naylor Hotel Building, San Angelo, Texas.

ARKANSAS
Does not have any production (proration) restrictions. The opportunity for quick "payouts" is obvious. Come here and investigate royalty and lease opportunities.
WILLIAM MONROE LAYTON
P. O. Box 411 Texarkana, Ark.

CUBA was Geophysically investigated and found O.K. Atlantic and Shell appropriated 60 billion acres. Are digging now. My lands first surrounded. Will sacrifice 50 acres at $2,000.00 a piece. Make your own Geophysical survey and choose lands you want, out of 1,000 acres property. Hold my property while surveying. Land entrance cost ½ of 1% oil. 2 miles from best highway and railroad. Roig, Linea 145 Vedado, Havana, Cuba.

Business Opportunities

GEOLOGIST desires connection on percentage basis plus expenses. Highest credentials. Address Box G-823, The Oil and Gas Journal, 415 Lexington Avenue, New York City.

WANTED: Loan of $25,000.00 for expansion Natural Gasoline plant East Texas oil field; going concern and making profit; excellent market for all gasoline can make. Address F. J. Morris, Box 187, Tyler, Texas.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

INDEX TO ADVERTISERS

A

Abercrombie, J. S., Co. 177
Abercrombie Pump Co. 191
Air-Maze Corp. ....
Air Reduction Sales Co. ....
Ajax Iron Works ....
Alco Products, Incorporated ....
Aldrich Pump Co., The ....
Allied Steel Products Corp. ....
Allis-Chalmers Mfg. Co. ....
Allsteel Products Mfg. Co., The ....
American Askania Corp. ....
American Cable Division of American Chain & Cable Co., Inc. ....
American Cast Iron Pipe Company
American Geophysical Co., The ....
American Hammered Piston Ring
American Iron & Machine Works
American Lubricator Company ....
American Manganese Steel Company U38
American Meter Company 4
American Roller Bearing Company
American Rolling Mill Co., The ....
American Sand-Banum Co., Inc. ..198
American Seismograph Company
American Steel & Wire Company 167
Ampco U84
Armstrong Machine Works U82
Arrowhead Iron Works ....
Athey Truss Wheel Co. ....
Atlas Drop Forge Co. ....
Atlas Imperial Diesel Engine Co. .163
Atlas Supply Co. ....
Auer, C. L., and W. W. ....
Axelson Manufacturing Company. 54

B

Baash-Ross Tool Company ....
Babcock & Wilcox Tube Co., The .U81
Badger & Sons Co., E. B. ....
Bakelite Corporation ....
Baker Oil Tools, Inc. 6-199
Baldwin-Southwark Corporation
Banner Iron Works U60
Baroid Sales Company 31
Barret, William M., Inc. ....
Barrett Company, The ....
Beaumont Iron Works Co. ....
Belmont Packing & Rubber Co., The U92
Bethlehem Steel Co. ....
Bigelow-Liptak Corporation U66
Black, Sivalls & Bryson, Inc. U73
Boston Woven Hose & Rubber Co. 47
Braden Steel Corporation ....
Bradford Motor Works, Inc. 183
Brewster Company, The 40
Bridgeport Machine Company
Broderick & Bascom Rope Co.
Brown Instrument Co., The U47
Buckeye Traction Ditcher Co., The
Butler Manufacturing Co. ....
Byron Jackson Co. ....

C

Calorizing Company, The U95
Cameron Iron Works, Inc. ....
Carey Company, The Philip ....
Carnegie-Illinois Steel Corporation
Carson Machine & Supply Co. ....
Case Company, J. I. ....
Cast Iron Pipe Research Association, The ....
Caterpillar Tractor Co. 60-61
Central Forging Co., The ....
Chain Belt Company ....
Chaplin-Fulton Mfg. Co., The ....
Chapman Valve Mfg. Co., The ....
Chemical Process Co., Inc., The ....
Chevrolet Motor Company ....
Chicago Bridge & Iron Company U36-U37
Chicago Metal Mfg. Co. U86
Chiksan Oil Tool Co., Limited ....
Cities Service Oil Co. ....
Clark Brothers Company 33
Classified Advertising 222-223
Cleveland Trencher Company, The
Climax Molybdenum Company 57
Columbian Steel Tank Co.
Combustion Engineering Company U93
Compressed Industrial Gases, Inc. U65
Consolidated Chemical Industries, Inc. ....
Continental Chemical Company ....
Continental National Bank of Fort Worth ....
Continental Oil Co. ....
Continental Supply Company, The 51
Cooper, Fred E. ....
Cooper-Bessemer Corp., The ....
Coppus Engineering Corp. ....
Crane Co. U51
Crane Packing Co. ....
Crosby Steam Gage and Valve Co..U43
Crutcher-Rolfs-Cummings, Inc. ....
Cummins Engine Company ....
Curtin, W. H., and Co., The ....

D

Darling Valve & Mfg. Co. ....
Davis Regulator Co. ....
De Cavel & Roegiers ....
Dearborn Chemical Company ....
De La Vergne Engine Co. ....
Demag 196
Detrick Company, M. H. U62
Devine, J. P., Mfg. Co., The U61
Dewey Portland Cement Co. ....
Diamond Chain & Mfg. Co. ....
Dickey Clay Mfg. Co., W. S. 181
Dodge—Division of Chrysler Corp.
Dodge Mfg. Corporation 184
Doheny Stone Drill Co. ....
Dow Chemical Company U80
Dowell, Incorporated ....
Dresser, S. R., Mfg. Co. ....
Du Pont de Nemours & Co., Inc., E. I. ....
Durametallic Corporation U56

E

Eagle-Picher Lead Co. U67
Eastman Oil Well Survey Co. ....
Economy Electric Lantern Co. ....
Edward Valve & Mfg. Co., Inc. ..U39
Emsco Asbestos Company ....
Emsco Derrick & Equipment Company ....
Engineering Laboratories, Inc. ....
Ensign Carburetor Company, Ltd. 185
Ethyl Gasoline Corporation ..U90-U91
Eureka Tool Co. ....
Everstick Anchor Co. ....

F

Failing Supply Co., Geo. E. ....
Fairbanks, Morse & Co. ....
Filtrol Co. of California ....
First National Bank of Fort Worth
First National Bank & Trust Co. of Tulsa, The ....
Fisher Governor Company U85
Fluid Packed Pump Co. ....
Fluor Corporation, Ltd. ....
Foote Bros. Gear and Machine Corporation ....
Ford Motor Co. ....
Forty-Eight Insulations, Inc. U86
Foster Wheeler Corp. U46
Four Wheel Drive Auto Co., The
Foxboro Co., The U88-U89
Franks Mfg. Corp. 185
Frick-Reid Supply Corporation U44-U45

G

Gardner-Denver Company ....
Garlock Packing Company, The ....
Gaso Pump & Burner Mfg. Co. ....
Gasoline Products Co., The ....
Gates Rubber Co., The ....
Gatke Corporation ....
Gearench Mfg. Co. ....
General American Transportation Corporation—Terminal Division.165
General Electric Company ....
General Motors Truck Co. ....
General Power, Inc. ....
Geophysical Service, Inc. ....
Gilmer Company, L. H. ....
Girdler Corporation, The U72
Globe Oil Tools Company 48
Goodall Rubber Company ....
Gott, H. P., Mfg. Co. ....
Goulds Pumps, Inc. ....
Grant Oil Tool Company ....
Graver Tank & Mfg. Co., Inc. ....
Gray Processes Corporation, The
Great Lakes Coal & Coke Co. ....
Green Fire Brick Company, A. P. U70
Green Head Bit & Supply Co. ....
Guiberson Corporation, The 172
Gulf Oil Corp. ....
Gulf States Utilities Co. ....
Gustin-Bacon Mfg. Co. ....

H

Halliburton Oil Well Cementing Co. ....Inside Front Cover
Hanlon-Buchanan, Inc. ....
Happy Belting Company 47
Harnischfeger Corporation ....
Harrisburg Steel Corporation ....
Hazard Wire Rope Division of American Chain & Cable Co., Inc. ....
Heeter, C. M., Sons Co. ....
Hercules Tool Company ....
Hewitt Rubber Corp. ....
Hill, Hubbell & Co. ....
Hinderliter Tool Company ....
Hoard Exploration Company ....
Holder-Jewell ....
Hopper Machine Works, Inc. ....
Hough Mfg. Co., The Charles N. ....
Hughes Tool Co. ....Back Cover
Humble Oil & Refining Co. ....
Hunt Tool Company 177
Hyatt Bearings Division, General Motors Corporation ....
Hydrauger Corporation, Ltd. 181
Hydril Co. ....

I

Independent Exploration Company
Independent Pipe & Supply Co., Inc. ....
Ingersoll-Rand Co. ....
International Derrick & Equipment Co., The ....
International Filter Co. ....
International Harvester Co. of America, Inc. ....
International Nickel Company, Inc., The ....
International Supply Co. ....

J

J & S Carburetor Co. ....
Jarecki Manufacturing Company
Jenkins Bros. ....
Jensen Brothers Manufacturing Co. 183
Jerguson Gage & Valve Co. U80
Johns-Manville Corporation U71-191
Johnston & Jennings Co. (Oceco Division) ....
Johnston, M. O., Oil Field Service Corp. ....
Jones Company, The S. M. ....
Jones & Laughlin Steel Corporation ....

K

Kellogg, M. W., Company, The ....
Kennedy Valve Mfg. Co., The ....
Kerotest Manufacturing Co. ....
Keuffel & Esser Co. ....
Key Company U63
Keystone Driller Co. ....
Kibele Manufacturing Co. ....
Klemp Co., Wm. F. U76

L

Landis Machine Co., The 1
Lane-Wells Co., The 42
Larkin Packer Co. Inside Back Cover
Lawrence System ....
Layne and Bowler Co., The ....
Layne & Bowler, Inc. 175
Leach Co., C. H., Inc. ....
Leeds & Northrup Company U34
Leonard Construction Co. ....
Le Roi Company ....
Leschen, A., Sons Rope Co. U77
Lincoln Electric Company, The ....
Linde Air Products Co., The ....
Link-Belt Company 190
Lockheed Aircraft Corporation ....
Lone Star Cement Corporation 22
Lone Star Gasoline Co. ....
Lucey Products Corporation ....
Ludlow Valve & Mfg. Co., The 185
Lufkin Foundry & Machine Co. ....
Lufkin Rule Co., The ....
Lummus Co., The U83
Lunkenheimer Co., The ....

Mc

McAlear Mfg. Co., The U94
McCord Radiator & Mfg. Co. ....
McGregor Working Barrel Company ....
McKee & Co., Arthur G. U40-U41
McKissick Products ....

M

MacClatchie Manufacturing Company ....
Machlett, E., & Son U78
Macwhyte Co. ....
Maloney Tank Mfg. Co. 39
Manhattan Rubber Mfg. Division ....
Manzel Brothers Company ....
Marley Company, The ....
Marmon-Herrington Co., Inc. ....
Martin-Decker Corp. 164
Mathey Machine Works, C. A. ....
Mattison-Wallack & Co. ....
Mayo Hotel 192
Medart Company, The ....
Meehanite Metal Corporation ....
Mepham, Geo. S., Corporation ....
Merco Nordstrom Valve Co. ....
Metallo Gasket Company U78
Metric Metal Works 4
Midco Tool & Supply Co. ....
Midwest Piping & Supply Company, Inc., The U55
Miller Sand Pump Co. ....
Minneapolis-Moline Power Implement Company ....
Mission Mfg. Co., The 35
Monsanto Chemical Company ....
Muskegon Boiler Works U64
Muskogee Iron Works ....

N

National Airoil Burner Company .U58
National Bank of Tulsa ....
National Lead Co. ....
National Meter Company U92
National Supply Co., The 26
National Transit Pump & Machine Co. U57
National Tube Co. 58
Natural Gas Equipment Co. of Texas ....
Naylor Pipe Company ....
New Deal Specialty Co., The ....
Newman, Hender & Co., Ltd. ....
Norvell-Wilder Supply Company ....

O

O-K Machine & Manufacturing Co.
O'Bannon Co., Walter ....
Oceco Fittings ....
Oil Center Tool Co. ....
Oil Well Supply Company ....
Oil World Exposition ....
Oklahoma Gas and Electric Company ....
Oklahoma Portland Cement Co. ..180
Otis Pressure Control, Inc. ....
Owens-Illinois Glass Company ....
Oxweld Acetylene Company ....

P

Page Steel & Wire Division of American Chain & Cable Co., Inc.
Parkersburg Rig & Reel Co., The 2
Parsons Co., The Ralph M. U59
Parsons Company, The ....
Patterson-Ballagh Corporation ....
Penberthy Injector Co. ....
Pennsylvania Grade Crude Oil Association ....
Petroleum Electric Power Club .. 44
Petroleum Engineering, Inc. ....
Petroleum Engineering Research

P

Petroleum Iron Works Company ....
Petty Geophysical Engineering Co.
Pittsburgh-Des Moines Steel Company ....
Pittsburgh Equitable Meter Co. ....
Pittsburgh Steel Company ....
Polymerization Process Corporation, The ....
Pomona Pump Co. ....
Portable Rig Co. ....
Precision Scientific Co. U75
Preformed Wire Rope ....
Prest-O-Lite Company, Inc., The ....
Price Co., H. C. ....
Pure Oil Co. ....
Pyle-National U48

R

Reading-Pratt & Cady Division of American Chain & Cable Co., Inc.
Rector Well Equipment Co., Inc. ....
Reed Roller Bit Company 177
Regan Forge & Engineering Co. 177
Reilly Tar & Chemical Corporation
Republic Steel Corporation ....
Ridge Tool Co., The ....
Rieber Laboratories ....
Ross Heater & Mfg. Company, Inc. U49
Ryerson & Son, Inc., Joseph T. ..183

S

Schaar & Company U84
Schlumberger Well Surveying Corporation ....
Scientific Glass Apparatus Co. U85
Security Engineering Co. ....
Seismograph Service Corp. ....
Shaffer Specialty Co., The ....
Shaffer Tool Works ....
Shand & Jurs Co. 36
Sharples Specialty Co., The ....
Shell 169
Sinclair Refining Company, Inc.
Sivyer Steel Casting Company U74
Skinner Co., M. B. ....
Smith, A. O., Corporation U68-U69
Smith Company, E. M. 187
Smith, Nowery J., Supply Company
Smooth-On Mfg. Co. ....
Socony-Vacuum Oil Co. ....
South Chester Tube Co. ....
South Texas Geophysical Corp. ....
Spang, Chalfant & Co., Inc. ....
Sperry & Co., D. R. U82
Sperry-Sun Well Surveying Co. ..183
Stahmer Shoe Co., F. H. ....
Standard Brake Lining Co. 177
Star Manufacturing Company ....
Struthers-Wells U50

T

Talco Asphalt & Refining Company U52-U53
Taylor Instrument Companies U87
Texaco Development Corporation
Texas Iron Works ....
Texas Steel Co. 170-171
Thornhill-Craver Co., Inc. 175
Timken Roller Bearing Company 52
Timken Steel & Tube Co. ....
Tobin Aerial Surveys, Edgar ....
Toledo Pipe Threading Machine Co. ....
Tretolite Co. ....
Trinity Portland Cement Company
Tube Turns, Inc. U79
Tulsa Boiler & Machinery Co. U95
Twin-Disc Clutch Co. ....

U

Union Carbide & Carbon Corporation ....
Union Carbide Sales Company ....
Union Steam Pump Co. U76
Union Wire Rope Corporation ....
United American Bosch Corp. ....
United States Rubber Company ....
United Supply & Manufacturing Company ....
Universal Atlas Cement Co. 19
Universal Oil Products Co. ....Front Cover-U33-U96

V

Vernon Tool Co., Ltd. ....
Vogt, Henry, Machine Co. U42
Vortox Mfg. Co. ....

W

Waldron Corp., John ....
Wall Rope Works, Inc. ....
Walworth Company 3-U54
Warren Petroleum Company ....
Waukesha Motor Company ....
Westcott & Greis, Inc. ....
Westinghouse Electric ....
Wheatley Bros. ....
Wheeling Machine Products Co. ..187
Wickwire Spencer Steel Company
Williams & Co., J. H. ....
Williamsport Wire Rope Co. ....
Wilson Manufacturing Co. ....
Wilson-Snyder ....
Wilson Supply Company ....
W. K. M. Company, Inc. 63
Worthington Pump & Machinery Corporation ....
Wyatt Metal & Boiler Works U35

Y

Young Engine Corporation ....
Young Radiator Company ....
Youngstown Sheet & Tube Co., The